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TABLE OF CONTENTS

The Anatomy Of A Robot Hero 2000

- **New Trends In Computer Languages**
- **Complete Details Of CD-I**
- **Spotlight On Medical Resources Part III**

ARTICLES

Trends In Computer Languages ... 7
A Funny Thing Happened In San Diego ... 7
Alice—Pascal Programming By The Numbers ... 8
Editorial ... 9
Summer CES—Seems (a Bit) Like Old Times ... 9

IBM-MS DOS

From "C" to Shining Sea ... 67
Productivity Software For IBM & MSDOS ... 67
Modula-2: A High Level Language For Systems Design 67
Microport Breaks The Price Barrier On UNIX* System V For The IBM PC-AT ... 68
Writing With Use of Textbase ... 104
Program Development—Start At The Finish ... 106
Compuware Corporation Announces Powerbase 2.2 116
Sharp Expands PC Line With AT-Compatible Unit . 120
Hewlett-Packard Offers PC-AT Compatibility ... 122
Personal Typesetting ... 130
Intel's New VLSI Graphics Coprocessor ... 134
PC/XT Compatible Single Board Computer Mounts On A 5.25 Inch Drive ... 134
WYSE's New PC AT-Compatible System ... 136
Micromint Offers Turnkey Bulletin Board System .. 136
Digital Research Announces Concurrent PC DOS Expanded Memory ... 140
Recognition System For Voice Under $130 ... 142
MCS to Demonstrate Voice-Actuated CADD System 144
G.O. Announces What's Best! Personal Version ... 144
DigiBoard Introduces New Multi-Channel Communications Board ... 145
Expanded Memory, Graphics Display And Multi-Functions On Single Card ... 146
Samna, AT&T Develop Write Power ... 147
IBM PC 640K Mother Board Upgrade ... 147
New Multilingual Word Processing Program ... 150
New Version of One-Write Plus With Expanded Chart of Accounts ... 150

ROBOTICS

Anatomy Of A Robot Hero 2000 ... 69
Probots And People—But What Can They Do? ... 69

COMMODORE

Commodore Introduces Low-Cost 64C Computer .. 71
GEOS Makes C-64 Look Like An Amiga ... 71
Inside Commodore ... 72
The Amiga Workbench ... 72
MiAmiga File—A Database For The Amiga ... 72
C128—CP/M Column ... 156
VIP Professional-Integrated Software for Amiga ... 164
RS232 Interface ... 165
Okidata Printer Offers NLQ For Commodore Users 165

APPLE

Ask The Guru ... 73
Modems For The Apple ... 74
Upgrading Kaypro CP/M ... 74
Franklin Ace Under $500 ... 218
Manzanita Releases BusinessWorks Payroll ... 219
The Apple CP/M Column Doin' The Ol' Disk Shuffle 220
Finalists In Apple's Computer Clubs Competition Announced ... 222

MACINTOSH

MacUniverse ... 75
Hard-Disk Storage Macintoshes, Apple IIs ... 75
Hayes Adds New Features For The Apple Macintosh 76

ATARI

Applying The Atari ... 77
Parrot Sound Digitizer ... 78

ATARI ST

Hacking The ST ... 79
LISP On The ST ... 80
Personal Pascal For The Atari ST ... 180

TEXAS INSTRUMENTS

TI Forum ... 81
Texas Instruments Introduces New OmniLaser Family of Page Printers ... 81
Texas Instruments Adopts PostScript For Laser Printer Family ... 82

TIMEX SINCLAIR

Sinclair Survival Column ... 83
FREE CONTEST ... 84

HEATH/ZENITH

Expanding Your Heath/Zenith PC ... 85
Videotape Your Computer Graphics ... 85

SANYO

The Silver Box ... 87
IT FIGURES — An IBM/Sanyo Calc-Sheet ... 88
Save Sanyo's Screen ... 88

SPOTLIGHT ON BUSINESS

Spotlight On Medical Resources Part III ... 89
Table II ... 89
Table III ... 90

MISCELLANEOUS

The New CD-I Mass Storage Technique ... 91
Tests Confirm Protection Against VDT Radiation .. 92
Palantir Software MS-DOS Or CP/M? ... 92
Review — *Serious Programming In BASIC* ... 188
Forth Model Library Now Available From The Forth Interest ... 188
Computers And Dyslexia ... 189

OTHER

Showcase ... 252, 254, 256 & 258
Bulletin Board ... 246, 248 & 250
Classified Index ... 260
Users Group ... 233, 234, 235, 236, 238, 240 & 242
Service Directory ... 280
Advertiser Index ... 6
Coming Events ... 232

THINGS TO COME

- **A *COMPUTER SHOPPER* First** Build Your Own P.C. Sprint Board — Increases CPU Performance Up To 2 Times Normal
- Hard Disks For Commodore C-128/C-64
- Computers Go Back To School

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GLENN E. PATCH
Chairman of the Board

ATARI

Applying The Atari

by Jeff Brenner

"Applying The Atari" is two years old this month! And we're going to celebrate with August's feature program: a practical computerized phone directory program.

Since the inception of "Applying The Atari," in August 1984, we have been steadily gaining new readers, in spite of Atari's incredible instability during that period of time. But the present outlook for Atari is healthier than it has been for years. The ST line has been a wonderful success, and Atari's 130XE is selling strong. And now Atari is arousing excitement in a completely different league with its anticipated CAD/CAM machines.

And what does the future hold for "Applying The Atari?" As I have said in the past, this column will remain devoted to the 8-bit line. Atari, too, has pledged to continue supporting the 8-bit line with software and hardware, such as an 80-column card due to be released this month and 3.5 inch disk drives. Many ST-owners have been asking for ST-compatible "Applying The Atari" diskettes, and if the interest is strong enough, I will create two versions, 8-bit and 16-bit, of future "Applying the Atari" programs. Any such ST listings would be printed in a separate article or section, though, and would not take away from 8-bit Atari space. Let me know if you're interested.

Reader Mail

Dear Jeff:

While reading the "Atari Help" column in the April 1986 issue of *Computer Shopper*, I became very interested in the name "Omniview," which was mentioned by Mr. Alan McPherron. In the article, Mr. McPherron was complaining of the poor performance of his monitor. The paragraph was entitled XL "Video Smears," and concerned characters which were not clear. He concluded the article by relating that he was considering the Omniview for his XL, but elected not to because his video probelms were bad enough with 40 columns. To put it in a nutshell, what is Omniview? In closing, regarding Mr. McPherron's problem, I am using a Zenith monitor, Model ZVM-1220-A, and my characters are superbly sharp. The price was only $99.00 and I am perfectly satisfied.

Thomas H. Connors
SSG, US Army Europe

A. Omniview is an 80-column adapter which allows the Atari to display 80 characters per line when used with software designed for it. Mr. McPherron was concerned that since he could not get a sharp display with Atari's normal 40-column screen, an 80-column screen would make matters worse. Many 800XL owners have written to me about the blurred-character problem, which is apparently caused by the 800XL's lack of chroma pin output (used with a monitor). Still others have said they have not had any problem at all.

For those suffering with XL "video smears," a simple hardware remedy, submitted by Ricky J. Burgett, was published in the June 1986 column.

And while on the subject of video displays:

Dear Jeff:

I use a Sharp 7 system color TV for a monitor. I think my RF modulator is FUBAR because since I have had the XL I would get red and green vertical bars on the screen after about an hour of use. Also, turning on my printer made my display unreadable. A friend pointed out that his TV was supposed to be a "monitor/TV" and tried using a five pin din to RCA stereo cable to connect the video output to the VCR input on his monitor/TV. It works very nicely. We have a super sharp picture with absolutely no interference.

Mike Blevins
APO, New York

A. I've printed your diagram under Figure 1. Thanks for sharing it.

Dear Jeff:

Now that I have a XM301 modem and two of the fastest "disk drives" around (RAMDISKS) and a 1050 drive, I have thought about putting up my own BBS. I would like to be able to put a large message and upload/download base for public domain software, but the hardware to interface Atari hard drives and 8 inch floppies cost mega bucks! I was looking through the *Computer Shopper* and had a thought. What if an interface could be built and programmed (with an EPROM burner) to interface the lesser expensive 10MB driver and IBM drives. I have seen used and untested drives around $50-$160!!! The ATR8000 would (I hear) interface these drives, but the cost is way out of my range.

Patrick Presley
Tumberton, Texas

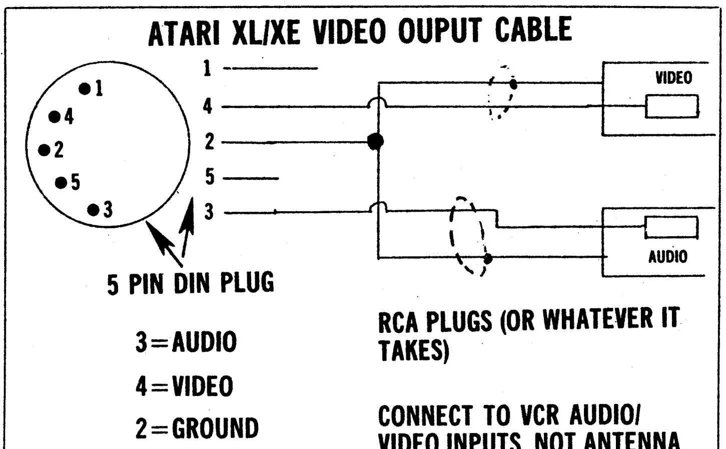

ATARI XL/XE VIDEO OUPUT CABLE
1
4
2
5
3
VIDEO
AUDIO
5 PIN DIN PLUG
3=AUDIO
4=VIDEO
2=GROUND
RCA PLUGS (OR WHATEVER IT TAKES)
CONNECT TO VCR AUDIO/ VIDEO INPUTS, NOT ANTENNA

Figure 1

A. While I'm sure it would be possible to build the type of interface you write of, it would be an enormous task, and I, for one, certainly would not want to undertake it. Designing the hardware is difficult and time consuming as it is. Designing software from scratch for your new interface is then an additional burden. People who undertake such projects are usually those who ultimately intend to market a finished product, such as the ATR8000. Otherwise you may feel the effort is just not worth it.

Since you already have RAMdisks, you can build yourself quite a powerful bulletin board by adding a hard disk drive specifically designed for your Atari. Supra Corporation (1133 Commercial Way, Albany, OR 97321) sells a 10MB hard disk, which includes a hard disk DOS, for $799. True, this too may be out of your price range, but if you are very serious about running a bulletin board, you should consider it. The drive could, of course, be used for other applications when your bulletin board is not on-line. Supra also sells it's hard disk interface separately for $250.

Book Winner

Congratulations to Gene Gnandt of Houston, Texas. Gene won WSI's *Atari XL User's Handbook* ($15.95, Weber Systems Inc., 8437 Mayfield Road, Cleveland, OH 44026) in April's random drawing.

Newsletters

This month's mail brings the newsletter of the High Sierra Atari Users Group (P.O. Box 2152, Sparks, NV 89432), the thick JACG Newsletter from the Jersey Atari Computer Group (14 Whitman Drive, Denville, NJ 07834), and the N.O.A.U.G. newsletter of the New Orleans Atari Users Group (5630 Jefferson Hwy., Harahan, LA 70123).

Atari Telephone Master

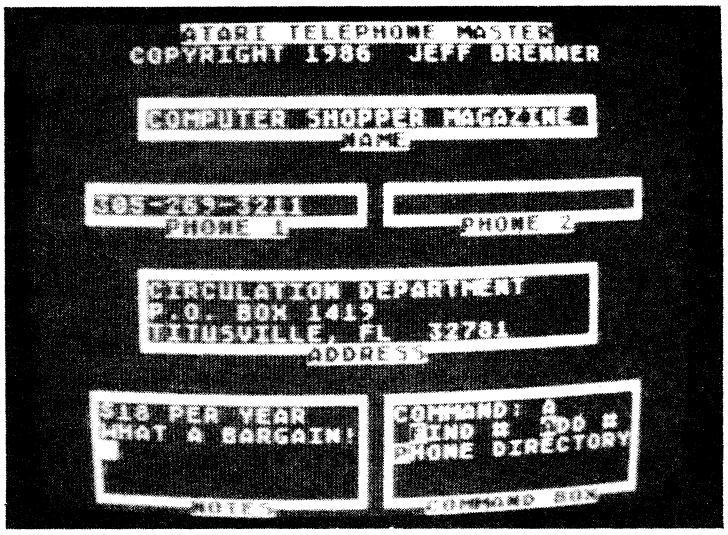
Atari Telephone Master lets you record and recall all of your telephone numbers. One or two numbers can be stored for each person. In addition, Atari Telephone Master allows you to record the address and a note for each person on file. A directory command gives you a complete, alphabetized directory of all numbers.

The program is listed under the "Atari Telephone Master" heading. It's a long program, so I urge you to use Program Perfect if you're typing in the program. A minimum of 32K RAM and a disk drive are required to use Atari Telephone Master.

Running The Program

Once the program has been entered, save it to diskette. Now RUN the program. You'll be asked to "Insert Data Disk And Press Return." You can use the same diskette that the program was saved on, or you can use a blank, formatted diskette if you want to store as many names as possible on a single diskette. Depending on the disk drive density being used and the amount of memory in your computer, you can store hundreds of names on a single diskette.

When your data diskette is in place, press Return and you'll be told, "No Phone File On This Diskette," and then asked, "Create a File On This Disk?" Since this is the first time you are using the program, you must create a file, so press Y. To store as many names as possible to a single diskette, you may choose to insert a blank, formatted diskette before you press y.



```
ATARI TELEPHONE MASTER
COPYRIGHT 1986  JEFF BRENNER

COMPUTER SHOPPER MAGAZINE
NAME

305-269-3211            
PHONE 1                 PHONE 2

CIRCULATION DEPARTMENT
P.O. BOX 1419
TITUSVILLE, FL  32781
ADDRESS

$18 PER YEAR            COMMAND: A
WHAT A BARGAIN!         FIND # ADD #
                        PHONE DIRECTORY
NOTES                   COMMAND BOX
```

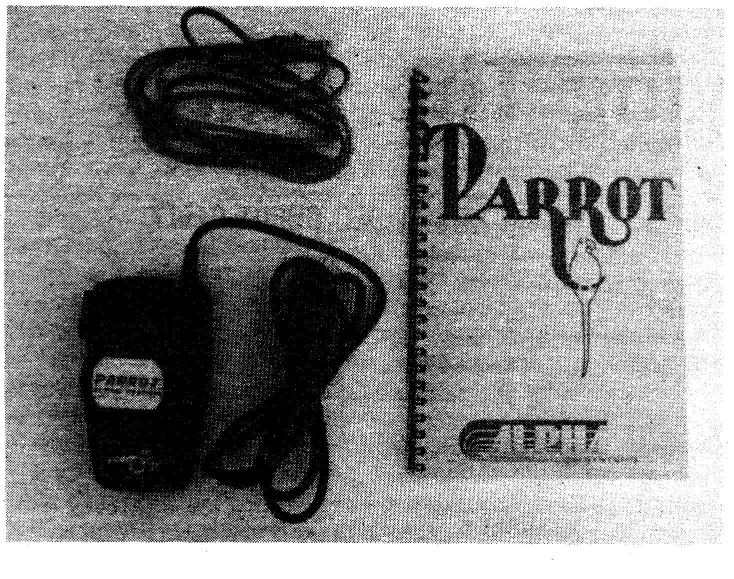
The next screen is the main display. Photo 1 shows this screen on a preliminary version of the program. The current version displays in the upper-left corner of the screen the number of names in memory at any time, and the maximum number of names allowed by

continued on page 78

Parrot Sound Digitizer

by Jeff Brenner

All across America Atari owners are digitizing themselves, their families, neighbors, cars, disk drives, shoes and anything else that can stand still for nine seconds, thanks to Digitial Vision's ComputerEyes. In another dimension of excitement, Atari owners are digitizing their voices, musical instruments, breaking glass, and barking dogs, among other sounds, with Covox's Voice Master. And now Alpha Systems will certainly put many more sound digitizers into Atari owners' hands with its Parrot sound digitizer. At $39.95, hardware and software included, Parrot costs less than half the price of Covox's $89.95 Voice Master and offers comparable sound digitizing performance.



You Get What You Pay For?

The secret to Alpha System's low price is apparent immediately upon opening the package. I was not sure if some fellow Atarian had invaded my mailbox or if I was the victim of some awful mail order fraud. Inside was a paddle game controller with a microphone jack in it (actually half of a two-paddle controller; the other paddle had been cut off), a jumper wire, an instruction manual and a diskette. My suspicions were alleviated slightly when I began reading the instruction manual. Sure enough, right there on page eight was a drawing of the half-of-a-paddle-controller sound digitizer. Still, I was disappointed. I wouldn't even leave my own hardware projects in such a raw state. Alpha Systems could make their customers a lot more satisfied by charging five or ten dollars more and sticking the device in a cheap project box.

But It Works!

Unlike Voice Master, Parrot does not include its own microphone. You can either plug your own microphone into the input jack, or use the jumper wire to connect the Parrot directly to a sound source, such as the output jack of a cassette player or radio.

The sound digitizing, or sampling, is performed through the Parrot Sampler Program included on the diskette. The paddle dial is used to "fine-tune" the digitizer as you whistle into the microphone (or play a tape) until an acceptable quality of sound is heard through the television speaker. The sound quality that you achieve through the fine-tuning procedure will be the same that you get when you begin the actual sound sampling.

Digitizing with a microphone was easy enough. After fine-tuning, I selected the Record option, spoke a few words, and then used the Playback option to hear my Atari speak by words. The Parrot's sound quality was comparable to Voice Master's, although this will vary from user to user depending upon the quality of the microphone and the nature of the sound source used.

Sampling from a cassette player proved to be much more difficult than with a microphone. In addition to the paddle dial, it was necessary to adjust the volume, treble and bass controls to get an acceptable sound sample, but I could not achieve the same level of quality I had with the microphone. The solution, I found, was to tape the microphone to one of the ear-pieces of headphones that were plugged into the tape player. That seemingly non-productive maneuver increased the sound quality from the tape recorder dramatically. Also, you'll want to use a battery operated tape player or radio when sampling from these sources; anything plugged into the house current tends to produce excessive interference in the resultant sound sample.

In addition to the fine-tuning, record, and playback options, the Parrot Sampler Program also allows you to save samples to disk for later retrieval.

The Emulator

Included on the Parrot diskette is the Emulator Program, an excellent sound editing program that easily compensates for the cheap digitizer hardware. Modeled after an expensive music synthesizer of the same name, the Emulator Program lets you use your Atari keyboard to play you sampled sounds. You can edit and combine sound files, plot the sound waves on a graph, and even change the actual sound.

The Emulator offers nine tracks in which sound data can be stored; thus as many as nine different sounds can reside in memory at once. Sampled

continued on page 206

Applying The Atari
continued from page 77

your system. Additionally, the current version displays the following commands in the Command box: Find, Add, Print, Edit, Quit and # Dir.

The first thing you'll want to do is add names. Press A for this command. The cursor will appear in the Name box. Type the first name followed by the last name (with middle names or initials between them, of course) and press Return. The cursor will appear in the Phone 1 box. If you need to move back to the Name box, use the control-cursor keys or the Delete key to bring the cursor to the left-most side of the box and press Delete.

In the Phone 1 box, type the phone number. If an individual has two telephone numbers, type the second number in the Phone 2 box, otherwise press Return and the cursor will move into the Address box. The Select key can also be used to move to the next box.

Up to three lines can be typed in the Address box. If you only need two lines, simply press Return on the third line, or press the Select key. Finally, the Notes box is for any information about the individual you want to jot down. Since this information is printed along with each name when a phone directory is listed, you might want to describe the individual's relation to you (i.e. doctor, attorney, etc.), or you can store temporary information that can be deleted later (i.e. "This guy owes me eleven bucks"). Up to five lines can be typed in the Notes box. When you're done, type Return on a blank line or press Select. The information you have entered will be saved to disk and the cursor will reappear in the Name box so you can type the next name.

When you have finished entering names and numbers for a session, press the ESC key. The names will then be alphabetized, additional data will be saved to the diskette, and you will be returned to the Command prompt.

One note about the command box before we learn about the other commands: All instructions and error messages are displayed on the last line of the Command box, so it's a good idea to keep an eye on that part of the screen.

The Find command allows you to look up a particular individual's number, address, and notes. Press F and then type the name of the individual. It is not necessary to type the full name of the person; only the last name, or even an initial and a last name (i.e. type Smith or T. Smith to find Theodore Smith). Of course, if your data file contained a Theodore Smith and a Tom Smith, you would have to type the full name to get the person you want. If the name is not found, you'll get a "Not Found" message in the Command box.

Once you have found a name, or whenever a name/number is displayed on the screen, you can press E at the "COMMAND:" prompt to add, change or delete any of the information on the screen. Use the control-cursor keys to move within a box, and the Select key to move to the next box. Pressing Delete when the cursor is in the upper, left hand corner of a box will bring the cursor to the previous box. When you have finished editing, press the ESC key and the changes will be saved.

Press P to printout the information currently displayed on the screen (if you have a printer). If you just wanted to look up someone's number, you could use the Find command to look up the number, print it on the printer and drag the sheet to the telephone.

The # DIR command (press D) gives you a printout of all the names and addresses, phone numbers and notes on your diskette. The names are alphabetized and printed last name first, so the pages of this printout can be stapled together and used as a personal phone directory. If you want to interrupt the printing of the directory, press ESC.

The Quit command ends the program and brings you to the BASIC "Ready" prompt. Unlike the June 1986 BudgetMate, it is not a necessity that you end with the Quit command; you won't lose any data if you just shut off the computer (provided you are at the "Command:" prompt and not in the middle of some operation). However, it is a good practice to end with a Quit command, so make it a habit.

I hope you enjoy the Atari Telephone Master. Some of your BASIC programmers may want to add additional commands to make this program even more powerful. One that immediately comes to mind is an autodialer, for those of you with autodial modems. The string variables PHONE1$ and PHONE2$ contain the phone numbers that appear on the screen at any time, and you could easily add a "CALL" command which would automatically dial up the person on the screen.

Next Month

We'll learn how Atari Telephone Master works, and we'll have more reader mail, new products, and a surprise program to start off the third year of "Applying The Atari."

Readers' questions, comments and contributions are welcome. Please enclose a self-addressed, stamped envelope (SASE) for a personal reply.

A diskette of this month's program is available from the author for $7.00, postpaid. Please make checks payable to "Jeff Brenner" and specify your disk drive model.

"Program Perfect" is a utility used to check for typing errors while entering programs from this column. Readers may send $5.00 for a diskette or a SASE for a listing of this program.

Address all correspondence to: Jeff Brenner, "Applying The Atari 8/86", c/o *Computer Shopper*, P.O. Box F, Titusville, FL 32781. ●

Programs for Applying The Atari shown on pgs. 204, 206.

ATARI TELEPHONE MASTER

```
ASJ 10 REM ATARI TELEPHONE MASTER
KGJ 20 REM COPYRIGHT 1986 JEFF BRENNER
XEJ 30 FM=FRE(0)-1500:MAX=INT(FM/32)
SPJ 40 DIM NAME$(FM):NAME$=CHR$(0):NAME$(FM)=CHR$(0):NAME$(2)=NAME$
HKJ 50 DIM CE$(2),INV$(59):CE$=CHR$(30):CE$(2)=CHR$(31)
QPJ 60 RESTORE 70:FOR I=1 TO 59:READ N:INV$(I,I)=CHR$(N):NEXT I
OGJ 70 DATA 104,104,104,170,165,88,133,208,165,89,133,209,104,104,168,240,16
ROJ 80 DATA 24,165,208,105,40,133,208,165,209,105,0,133,209,136,208,240,24,138
OBJ 90 DATA 101,208,133,208,165,209,105,0,133,209,104,104,168,136,177,208,73
RLJ 100 DATA 128,145,208,136,16,247,96
RHJ 110 DIM NM$(30),PHONE1$(15),PHONE2$(15),ADDR$(78),MEMO$(75),M$(100)
CRJ 120 DIM C32$(50):C32$(1)=CHR$(32):C32$(50)=CHR$(32):C32$(2)=C32$
CEJ 130 DIM C21$(50):C21$(1)=CHR$(21):C21$(50)=CHR$(21):C21$(2)=C21$
NCJ 140 DIM C149$(50):C149$=CHR$(149):C149$(50)=CHR$(149):C149$(2)=C149$
UVJ 150 DIM DE$(20):DE$=CHR$(156):DE$(20)=CHR$(156):DE$(2)=DE$
AJJ 160 DIM ABC$(108):RESTORE 170:FOR I=1 TO 108:READ N:ABC$(I,I)=CHR$(N):NEXT I
MAJ 170 DATA 104,104,133,204,104,133,203,104,133,212,104,133,211,104,104,133
JNJ 180 DATA 209,165,203,133,207,165,204,133,208,162,0,134,210,134,213,232
HSJ 190 DATA 165,207,133,205,24,101,209,133,207,165,208,133,206,105,0,133
ATJ 200 DATA 208,160,0,177,207,209,205,240,4,144,9,176,27,200,196,209
MJJ 210 DATA 176,22,144,239,164,209,132,210,136,177,207,133,214,177,205,145
HRJ 220 DATA 207,165,214,145,205,136,16,241,232,208,2,230,213,228,211,208
HPJ 230 DATA 191,165,212,197,213,208,185,165,210,208,166,96
UWJ 240 OPEN #1,4,0,"K:":OPEN #2,9,0,"E:":GOSUB 250:GOTO 280
LEJ 250 GRAPHICS 0:POKE 16,64:POKE 53774,64:M$="ATARI TELEPHONE MASTER"
IVJ 260 GOSUB 700:POSITION 9,0:PRINT M$:POKE 85,6
JDJ 270 PRINT "COPYRIGHT 1986";CHR$(32);CHR$(32);"JEFF BRENNER":RETURN
FKJ 280 M$="RETURN":GOSUB 700:POKE 85,4:POKE 84,6
MCJ 290 PRINT "INSERT DATA DISK AND PRESS ";M$:POKE 752,1:PRINT DE$(1,4)
DUJ 300 POKE 764,255:GET #1,N:POKE 752,0
ADJ 310 TRAP 320:CLOSE #4:OPEN #4,4,0,"D:NAME.DAT":GOTO 390
WVJ 320 IF PEEK(195)<>170 AND PEEK(195)<>136 THEN GOSUB 720
FLJ 330 POKE 85,5:PRINT "NO PHONE FILE ON THIS DISKETTE."
HWJ 340 POKE 85,4:PRINT "CREATE A FILE ON THIS DISK (Y/N)?";
XYJ 350 GET #1,Q:PRINT CHR$(Q):IF Q=78 THEN 280
SYJ 360 IF Q<>89 THEN PRINT CHR$(28);CHR$(156);:GOTO 340
NVJ 370 CLOSE #4:OPEN #4,8,0,"D:NAME.DAT":CLOSE #4:OPEN #4,8,0,"D:PHONE.DAT"
WZJ 380 CLOSE #4:GOTO 460
UOJ 390 INPUT #4,NUM:NAME$="":FOR I=1 TO NUM
AXJ 400 INPUT #4;M$:NAME$(LEN(NAME$)+1)=M$:NEXT I:CLOSE #4
MRJ 410 TRAP 450:CLOSE #4:OPEN #4,6,0,"D:*.*"
TOJ 420 INPUT #4;M$:IF M$(5,8)<>"FREE" THEN 420
QLJ 430 MN=VAL(M$)*125/230:IF MN<MAX THEN MAX=INT(MN)
WWJ 440 CLOSE #4:GOTO 460
YDJ 450 CLOSE #4:MAX=NUM
YSJ 460 GOSUB 1810:POSITION 22,19:PRINT CHR$(198);"IND #";
YOJ 470 PRINT C32$(1,2);CHR$(193);"DD #"
AWJ 480 POSITION 22,20:PRINT CHR$(208);"RINT";C32$(1,3);CHR$(197);"DIT"
EEJ 490 POSITION 22,21:PRINT CHR$(209);"UIT";C32$(1,4);"# DIR"
LMJ 500 A=USR(ADR(INV$),32,21,1)
SNJ 510 GOSUB 670:CLOSE #3:POSITION 30,18:PRINT " ";CHR$(30);:CI=0
LUJ 520 CI=1-CI:A=USR(ADR(INV$),21,18,8):FOR DL=1 TO 10:NEXT DL
NBJ 530 IF PEEK(764)=255 THEN 520
NHJ 540 IF CI THEN A=USR(ADR(INV$),21,18,8)
PFJ 550 POKE 694,0:POKE 702,64:SE=0:GET #1,Q:IF Q>128 THEN Q=Q-128
PAJ 560 PRINT CHR$(Q):TRAP 40000
CAJ 570 IF Q=65 THEN EDIT=0:FIND=0:CLOSE #3:OPEN #3,9,0,"D:PHONE.DAT"
LEJ 580 IF Q=65 THEN GOSUB 760:GOSUB 2900
HZJ 590 IF Q=70 THEN GOSUB 2160:GOTO 510
YDJ 600 IF Q=81 THEN GRAPHICS 0:END
BMJ 610 IF Q=69 AND FIND THEN EDIT=1:GOSUB 2060:GOSUB 760:GOSUB 2900
MDJ 620 IF Q=68 THEN GOSUB 2980
LVJ 630 IF Q=80 THEN GOSUB 2680
BPJ 640 GOTO 510
WHJ 650 FOR FL=1 TO 10:A=USR(ADR(INV$),XF,YF,LF):FOR DLAY=1 TO 10:NEXT DLAY
WLJ 660 NEXT FL:RETURN
JAJ 670 POSITION 0,0:PRINT "NUM: ";NUM
IJJ 680 POSITION 0,2:PRINT "MAX: ";MAX
BFJ 690 RETURN
ESJ 700 FOR I=1 TO LEN(M$):M$(I,I)=CHR$(ASC(M$(I,I))+128):NEXT I:RETURN
EBJ 710 FOR I=19 TO 22:POSITION 21,I:PRINT C32$(1,15);:NEXT I:RETURN
PPJ 720 PRINT CHR$(253);"ERROR #";PEEK(195);
RTJ 730 PRINT :PRINT "        PRESS        TO CONTINUE"
PUJ 740 IF PEEK(53279)<>6 THEN 740
UEJ 750 GRAPHICS 0:RUN
NIJ 760 POSITION 21,22:PRINT CHR$(32);"ESC WHEN DONE";CHR$(32);
CGJ 770 A=USR(ADR(INV$),22,22,3):IF EDIT THEN 830
BMJ 780 POSITION 7,4:PRINT C32$(1,26);:POSITION 4,8:PRINT C32$(1,15);
DHJ 790 POSITION 4,8:PRINT C32$(1,15);:POSITION 21,8:PRINT C32$(1,15);
FAJ 800 POSITION 21,8:PRINT C32$(1,15);
GOJ 810 FOR I=12 TO 14:POSITION 7,I:PRINT C32$(1,26);:NEXT I
GPJ 820 FOR I=18 TO 22:POSITION 4,I:PRINT C32$(1,15);:NEXT I
YJJ 830 POSITION 7,4:L=33:Z=26:ST=1:GOSUB 920
YOJ 840 POSITION 4,8:L=19:Z=15:ST=2:GOSUB 920
BKJ 850 POSITION 21,8:L=36:Z=15:ST=3:GOSUB 920
BKJ 860 POSITION 7,12:L=33:Z=26:ST=4:GOSUB 920
BRJ 870 POSITION 4,18:L=19:Z=15:ST=5:GOSUB 920
DJJ 880 POSITION 30,18:PRINT CHR$(32)
HNJ 890 GOSUB 1330:GOSUB 1910
VWJ 900 IF E<>27 AND EDIT=0 THEN 760
BAJ 910 RETURN
NSJ 920 YH=PEEK(84):XH=PEEK(85):POKE 752,0
EZJ 930 KC=-1:PRINT CHR$(30);CHR$(31);:POKE 764,255
KDJ 940 IF PEEK(93)=213 THEN PRINT CHR$(28);CHR$(31);
PFJ 950 C=PEEK(53279):IF PEEK(764)=255 AND C<>5 THEN 950
IOJ 960 IF SE OR C<>5 THEN 990
WVJ 970 SOUND 1,0,6,8:IF PEEK(53279)<>7 THEN 970
HJJ 980 SOUND 1,0,0,0:RETURN
HIJ 990 POKE 694,0:POKE 702,64
MNJ 1000 GET #1,E:KC=KC+1:IF E=27 AND SE THEN RETURN
MWJ 1010 IF E=27 AND PEEK(84)=4 AND PEEK(85)=7 THEN POP :GOTO 900
VCJ 1020 IF E=27 THEN POP :GOTO 880
COJ 1030 IF E>31 AND E<91 AND PEEK(93)<>89 THEN PRINT CHR$(E);:GOTO 940
YVJ 1040 IF E=127 THEN E=31
BDJ 1050 IF E<>156 THEN 1070
GWJ 1060 POKE 85,XH:PRINT C32$(1,L-XH);:POKE 85,XH:PRINT CE$;:GOTO 940
XPJ 1070 IF E<255 THEN 1100
AGJ 1080 T=PEEK(85):POKE 85,L-1:PRINT CHR$(254);:POKE 85,T
GBJ 1090 PRINT CHR$(255);CE$;
AVJ 1100 IF E<>254 THEN 1130
PUJ 1110 T=PEEK(85):PRINT CHR$(254);:POKE 85,L-1:PRINT CHR$(255);
IUJ 1120 POKE 85,T:PRINT CE$;
NDJ 1130 IF E<28 OR E>31 AND E<>155 THEN 1230
MCJ 1140 XT=PEEK(85):YT=PEEK(84):PRINT CHR$(E);CE$;
KZJ 1150 IF E=155 THEN POKE 85,XH:XT=XH:PRINT CE$;
IMJ 1160 U=PEEK(93)
OWJ 1170 IF KC=0 THEN GOSUB 1320:IF M$(1,Z)=C32$(1,Z) THEN RETURN
CQJ 1180 IF E=155 THEN KC=-1
UBJ 1190 IF U<>89 AND U<>85 AND U<128 THEN 1230
JKJ 1200 IF E=155 THEN RETURN
XTJ 1210 IF E=155 THEN 1270
OVJ 1220 POKE 85,XT:POKE 84,YT:PRINT CE$;
BCJ 1230 IF E<>126 THEN 1270
YRJ 1240 XT=PEEK(85):POKE 85,XT-1:PRINT CE$;:U=PEEK(93):POKE 85,XT
CNJ 1250 IF U=89 OR U=85 OR U>127 THEN PRINT CE$;:GOTO 1280
SUJ 1260 PRINT CHR$(E);
DSJ 1270 GOTO 940
SDJ 1280 IF ST=4 AND PEEK(84)>12 THEN POKE 84,PEEK(84)-1:PRINT CE$;:GOTO 1270
SLJ 1290 IF ST=5 AND PEEK(84)>18 THEN POKE 84,PEEK(84)-1:PRINT CE$;:GOTO 1270
SJJ 1300 IF ST>1 THEN POP :ON ST GOTO 830,830,840,850,860
FGJ 1310 GOTO 1270
OHJ 1320 POKE 84,YT:INPUT #2;M$:POKE 85,XT:PRINT CE$;:RETURN
CDJ 1330 POSITION 7,4:INPUT #2;NM$:A=USR(ADR(INV$),7,4,26)
HUJ 1340 POSITION 4,8:INPUT #2;PHONE1$
ONJ 1350 A=USR(ADR(INV$),4,8,15):POSITION 21,8:INPUT #2;PHONE2$
NVJ 1360 A=USR(ADR(INV$),21,8,15)
XPJ 1370 ADDR$="":FOR I=12 TO 14:POSITION 7,I:INPUT #2;M$
MYJ 1380 A=USR(ADR(INV$),7,I,26)
NIJ 1390 ADDR$(LEN(ADDR$)+1)=M$(1,26):NEXT I
YEJ 1400 MEMO$="":FOR I=18 TO 22:POSITION 4,I:INPUT #2;M$
MNJ 1410 A=USR(ADR(INV$),4,I,15)
OMJ 1420 MEMO$(LEN(MEMO$)+1)=M$(1,15):NEXT I
MBJ 1430 NM$=NM$(1,26)
XXJ 1440 FOR I=LEN(NM$) TO 1 STEP -1:IF NM$(I,I)=CHR$(32) THEN NEXT I
TYJ 1450 IF I=1 THEN 1510
NWJ 1460 FOR J=I-1 TO 1 STEP -1:IF NM$(J,J)<>CHR$(32) THEN NEXT J
UBJ 1470 IF J<2 THEN 1510
LBJ 1480 M$=NM$(J+1,I):M$(LEN(M$)+1)=CHR$(32)
MVJ 1490 M$(LEN(M$)+1)=NM$(1,J-1):IF I<26 THEN M$(LEN(M$)+1)=NM$(I+1)
XHJ 1500 NM$=M$
USJ 1510 INV=ADR(INV$):A=USR(INV,7,4,26):A=USR(INV,4,8,15):A=USR(INV,21,8,15)
CMJ 1520 FOR I=12 TO 14:A=USR(INV,7,I,26):NEXT I
XFJ 1530 FOR I=18 TO 22:A=USR(INV,4,I,15):NEXT I:RETURN
FNJ 1540 DATA 6,2,9,21,26,15,155
JKJ 1550 DATA 6,3,153,32,26,25,155
DBJ 1560 DATA 6,4,11,149,11,206,193,205,197,149,11,12,155
JXJ 1570 DATA 2,5,155
BGJ 1580 DATA 3,6,9,21,15,15,9,21,15,15,155
IYJ 1590 DATA 3,7,153,32,15,25,153,32,15,25,155
WIJ 1600 DATA 3,8,11,149,4,208,200,207,206,197,160,177
GWJ 1610 DATA 149,4,12,11,149,4,208,200,207,206,197,160,178
TJJ 1620 DATA 149,4,12,155
JYJ 1630 DATA 2,9,155
HJJ 1640 DATA 6,10,9,21,26,15,155
LGJ 1650 DATA 6,11,153,32,26,25,155
LIJ 1660 DATA 6,12,153,32,26,25,155
LKJ 1670 DATA 6,13,153,32,26,25,155
YWJ 1680 DATA 6,14,11,149,9,193,196,196,210,197,211,211
VJJ 1690 DATA 149,10,12,155
LPJ 1700 DATA 2,15,155
CYJ 1710 DATA 3,16,9,21,15,15,9,21,15,15,155
LDJ 1720 DATA 3,17,153,32,15,25,153
OVJ 1730 DATA 67,79,77,77,65,78,68,58,32,7,25,155
KTJ 1740 DATA 3,18,153,32,15,25,153,32,15,25,155
KVJ 1750 DATA 3,19,153,32,15,25,153,32,15,25,155
KOJ 1760 DATA 3,20,153,32,15,25,153,32,15,25,155
KQJ 1770 DATA 3,21,153,32,15,25,153,32,15,25,155
UMJ 1780 DATA 3,22,11,149,5,206,207,212,197,211,149,5
UXJ 1790 DATA 12,11,149,2,195,207,205,205,193,206,196
YTJ 1800 DATA 160,194,207,216,149,2,12,255
NNJ 1810 RESTORE 1540:GOSUB 250
TUJ 1820 READ X,Y:POSITION X,Y+1
QFJ 1830 N=0:READ C:IF C=32 OR C=21 OR C=149 THEN READ N:GOTO 1870
JTJ 1840 IF C=255 THEN RETURN
NBJ 1850 PRINT CHR$(C);:IF C<>155 THEN 1830
FRJ 1860 GOTO 1820
APJ 1870 IF C=32 THEN PRINT C32$(1,N);
AMJ 1880 IF C=21 THEN PRINT C21$(1,N);
FBJ 1890 IF C=149 THEN PRINT C149$(1,N);
FNJ 1900 GOTO 1830
VGJ 1910 IF EDIT=0 THEN NUM=NUM+1:IF NUM>MAX THEN 2030
TPJ 1920 IF EDIT THEN HNUM=NUM:NUM=FIND:POINT #3,S,B:GOTO 1940
IEJ 1930 TRAP 2050:NOTE #3,S,B
UFJ 1940 HS=INT(S/256):LS=S-256*HS:FIND=NUM
URJ 1950 NM$(LEN(NM$)+1)=CHR$(HS):NM$(LEN(NM$)+1)=CHR$(LS)
KOJ 1960 NM$(LEN(NM$)+1)=CHR$(B)
WKJ 1970 NAME$(NUM*29-28,NUM*29)=NM$
YIJ 1980 IF NUM>1 THEN A=USR(ADR(ABC$),ADR(NAME$),NUM,29)
QUJ 1990 PRINT #3;PHONE1$:PRINT #3;PHONE2$
FTJ 2000 PRINT #3;ADDR$:PRINT #3;MEMO$
OWJ 2010 IF EDIT THEN NUM=HNUM
CQJ 2020 RETURN
MVJ 2030 POSITION 21,22:PRINT "TOO MANY NAMES ":A=USR(ADR(INV$),21,22,14)
CSJ 2040 RETURN
VKJ 2050 POSITION 21,22:PRINT "ERROR ";PEEK(195);C32$(1,6);:RETURN
JFJ 2060 OPEN #3,12,0,"D:PHONE.DAT":M$=NAME$(FIND*29-28,FIND*29)
FKJ 2070 HS=ASC(M$(LEN(M$)-2)):LS=ASC(M$(LEN(M$)-1))
DIJ 2080 B=ASC(M$(LEN(M$))):S=HS*256+LS
IYJ 2090 POINT #3,S,B:RETURN
AQJ 2100 NM$=NAME$(FIND*29-28,FIND*29)
RFJ 2110 HS=ASC(NM$(LEN(NM$)-2)):LS=ASC(NM$(LEN(NM$)-1))
OCJ 2120 B=ASC(NM$(LEN(NM$))):S=HS*256+LS:NM$=NM$(1,26)
SUJ 2130 CLOSE #3:OPEN #3,4,0,"D:PHONE.DAT":POINT #3,S,B
FRJ 2140 INPUT #3;PHONE1$:INPUT #3;PHONE2$:INPUT #3;ADDR$:INPUT #3;MEMO$
XYJ 2150 CLOSE #3:RETURN
KWJ 2160 POKE 752,1:POSITION 21,22:PRINT "TYPE NAME";C32$(1,6);:POKE 752,0
WTJ 2170 XF=21:YF=22:LF=9:GOSUB 650
DEJ 2180 POSITION 7,4:PRINT C32$(1,26);:POSITION 4,8:PRINT C32$(1,15);
EZJ 2190 POSITION 4,8:PRINT C32$(1,15);:POSITION 21,8:PRINT C32$(1,15);
GSJ 2200 POSITION 21,8:PRINT C32$(1,15);
IGJ 2210 FOR I=12 TO 14:POSITION 7,I:PRINT C32$(1,26);:NEXT I
IHJ 2220 FOR I=18 TO 22:POSITION 4,I:PRINT C32$(1,15);:NEXT I
NJJ 2230 POSITION 7,4:L=33:Z=26:ST=1:SE=1:GOSUB 920
HLJ 2240 POKE 752,1:POSITION 21,22:PRINT "PLEASE STAND BY";
PMJ 2250 A=USR(ADR(INV$),21,22,15)
CIJ 2260 POSITION 7,4:INPUT #2;NM$:NM$=NM$(1,26)
IGJ 2270 FOR I=LEN(NM$) TO 1 STEP -1:IF NM$(I,I)=CHR$(32) THEN NEXT I:I=1
PXJ 2280 IF I=1 THEN LNM=LEN(NM$):GOTO 2350
NYJ 2290 FOR J=I-1 TO 1 STEP -1:IF NM$(J,J)<>CHR$(32) THEN NEXT J
YJJ 2300 IF J<2 THEN M$=NM$:GOTO 2330
KUJ 2310 M$=NM$(J+1,I):M$(LEN(M$)+1)=CHR$(32)
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continued on page 206

Save Sanyo
continued from page 88

have a color monitor, you can still use the program, of course, but you won't get the colors.

Any program that saves the screen has to begin at the beginning. We have to know where our video screen starts. Now we've all read our *Sanyo Operator's Guide.* Concerning the video RAM, I must say, this book is a masterpiece of terse obscurity. It devotes a single page to an explanation of the Sanyo's video configuration. One page for this heavy subject. I literally memorized the few lines on page 5-39, trying to understand it. I never did, that way. What I have learned is from trial and error. Error, mostly.

Try this, for instance. If you'd like to see where your screen begins, type DEBUG. When the prompt appears, type D40:107A. At this memory location you'll see the start of the video. If you're using the 3C00:0000 screen, which Sanyo calls page 2, you might see 00 00 00 3C. That means that your screen memory at the moment starts at 3C00:0000. Yes, it does. Believe me.

Okay, you don't believe me. You want me to prove it. You say, "If what you tell me is right, then I can type E3C00:0, then enter "F", and a big dot will appear at the upper left hand corner of my screen." So you do all that, and the bar pops up in the middle of the screen. Am I wrong? No, I'm not. Let me explain. You see, you are writing to the screen at the time you are examining the memory at 40:107A. As DEBUG displays the memory dump, you are actually scrolling the screen down. Therefore, you'll never find the beginning of screen memory this way. It's impossible.

But there is a way to do it. And I can prove to you that I'm right; 40:107A does contain the start of video memory. It's not complicated, but it does require another computer and the MSDOS command CTTY AUX.

Okay, get yourself another computer. Borrow a friend's if you have to. Then connect your Sanyo to the second computer, using the RS232 serial ports and a null modem connector. You'll need the null modem connector because personal computers are always configured for DTE operation. A DTE device cannot communicate with another DTE device without a little help. The null modem connector supplies that help.

Load a terminal program into the second computer. Then, making sure the baud rate, parity, etc., are both compatible, type CTTY AUX on the Sanyo's keyboard. Hit ENTER on the Sanyo keys, and the MSDOS prompt should appear on the second computer's CRT. If it doesn't, you've done something wrong; go back and check your connectors.

But supposing, by some miracle, everything is working right. You are now controlling your Sanyo from the second computer. Try typing DIR, and you see the Sanyo's disk directory appear on this CRT.

Now, on this keyboard, type DEBUG, hit ENTER, and when DEBUG loads, all screen and keyboard operations will be conducted from the second

continued on page 208

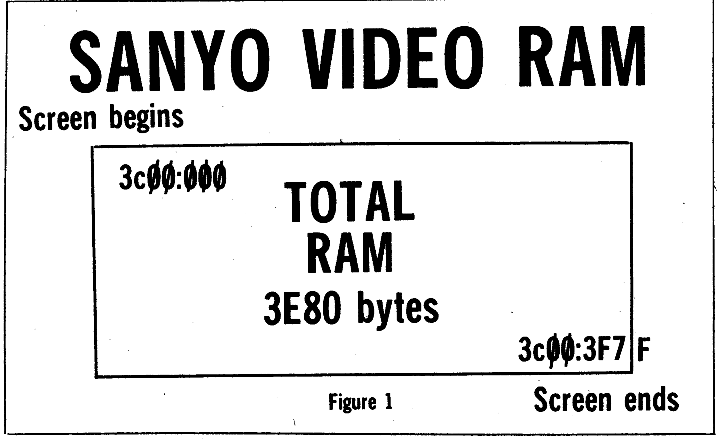

Figure 1

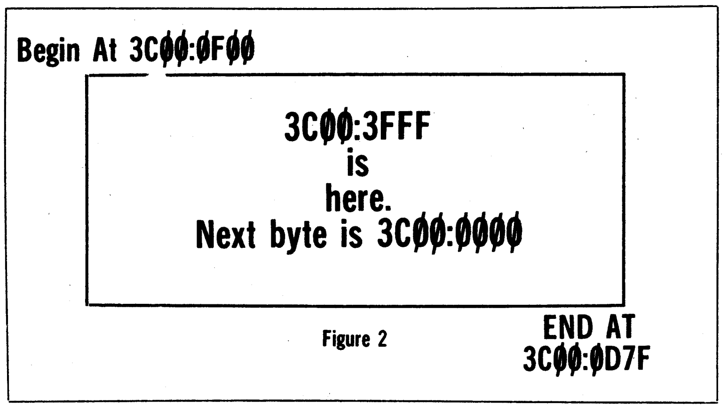

Figure 2

Atari Telephone Master Program
continued from page 204

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MOJ 2320 M$(LEN(M$)+1)=NM$(1,J-1):IF I<26 THEN M$(LEN(M$)+1)=NM$(I+1)
PDJ 2330 NM$=M$:FOR I=LEN(NM$) TO 1 STEP -1:IF NM$(I,I)=CHR$(32) THEN NEXT I
YYJ 2340 IF I>1 THEN NM$=NM$(1,I-1):LNM=LEN(NM$)
GQJ 2350 IF NM$=NAME$(1,LNM) THEN FIND=1:GOTO 2440
UQJ 2360 F=1:L=NUM:KT=0
HPJ 2370 OL=FIND:FIND=INT(F+(L-F)/2+0.5)
JDJ 2380 IF OL=FIND THEN KT=KT+1:IF KT>3 THEN 2600
VBJ 2390 IF NM$=NAME$(FIND*29-28,FIND*29-29+LNM) THEN 2440
CNJ 2400 IF NM$<NAME$(FIND*29-28,FIND*29-29+LNM) THEN L=FIND:GOTO 2420
ALJ 2410 F=FIND
UJJ 2420 IF L-F THEN 2370
FIJ 2430 GOTO 2600
DWJ 2440 GOSUB 2100:IF LNM=26 THEN 2500
GOJ 2450 FOR I=1 TO LEN(NM$):IF NM$(I,I)<>CHR$(32) THEN NEXT I:GOTO 2490
DEJ 2460 IF I=1 OR I=LEN(NM$) THEN 2490
DKJ 2470 M$=NM$(I+1,LEN(NM$)):GOSUB 2570:M$(LEN(M$)+1)=CHR$(32)
ARJ 2480 M$(LEN(M$)+1)=NM$(1,I-1):NM$=M$
REJ 2490 POSITION 7,4:PRINT C32$(1,26);:POSITION 7,4:PRINT NM$;
JHJ 2500 POSITION 21,22:PRINT "FOUND";C32$(1,10);:A=USR(ADR(INV$),21,22,5)
EKJ 2510 POSITION 4,8:PRINT PHONE1$;
GRJ 2520 POSITION 21,8:PRINT PHONE2$;:FOR II=1 TO 3:POSITION 7,11+II
TTJ 2530 PRINT ADDR$(II*26-25,II*26);:NEXT II
HUJ 2540 FOR II=1 TO 5:POSITION 4,17+II
UIJ 2550 PRINT MEMO$(II*15-14,II*15);:NEXT II
CZJ 2560 RETURN
EIJ 2570 FOR II=LEN(M$) TO 1 STEP -1:IF M$(II,II)=CHR$(32) THEN NEXT II
QKJ 2580 IF II=LEN(M$) OR II=1 THEN RETURN
DRJ 2590 M$=M$(1,II):RETURN
LFJ 2600 POKE 752,1:POSITION 21,22:PRINT "NOT FOUND";C32$(1,6);:POKE 752,0
KYJ 2610 XF=21:YF=22:LF=9:GOSUB 650:FIND=0:RETURN
OSJ 2620 CLOSE #3:OPEN #3,12,0,"D:PHONE.DAT"
PMJ 2630 HS=ASC(NM$(LEN(NM$))):LS=ASC(NM$(LEN(NM$)-1)):B=ASC(NM$(LEN(NM$)-2))
OTJ 2640 A=USR(ADR(ABC$),ADR(NAME$),NUM,29)
RMJ 2650 S=HS*256+LS:POINT #3,S,B
PMJ 2660 PRINT #3;PHONE1$:PRINT #3;PHONE2$:PRINT #3;ADDR$:PRINT #3;MEMO$
YFJ 2670 CLOSE #3:RETURN
KNJ 2680 POSITION 21,22:POKE 752,1:PRINT "PRINTING";C32$(1,7);
THJ 2690 A=USR(ADR(INV$),21,22,8):TRAP 2880:CLOSE #4:OPEN #4,8,0,"P:"
EBJ 2700 PRINT #4;"NAME/ADDRESS";C32$(1,15);"PHONE 1";C32$(1,9);"PHONE 2";
SGJ 2710 PRINT #4;C32$(1,9);"NOTES"
FYJ 2720 PRINT #4;"------------";C32$(1,15);"-------";C32$(1,9);"-------";
LWJ 2730 PRINT #4;C32$(1,9);"-----"
CJJ 2740 POSITION 7,4:INPUT #2;NM$:A=USR(ADR(INV$),7,4,26)
IOJ 2750 IF LEN(NM$)>26 THEN NM$=NM$(1,26)
MXJ 2760 POSITION 4,8:INPUT #2;PHONE1$:A=USR(ADR(INV$),4,8,15)
QPJ 2770 POSITION 21,8:INPUT #2;PHONE2$:A=USR(ADR(INV$),21,8,15)
LDJ 2780 PRINT #4:PRINT #4;NM$;CHR$(32);PHONE1$;CHR$(32);PHONE2$;CHR$(32);
KXJ 2790 POSITION 4,18:INPUT #2;M$:PRINT #4;M$(1,15)
JUJ 2800 FOR I=12 TO 14:POSITION 7,I:INPUT #2;M$:A=USR(ADR(INV$),7,I,26)
KPJ 2810 PRINT #4;M$(1,26);:POSITION 4,I+7:INPUT #2;M$:PRINT #4;C32$(1,33);
PCJ 2820 PRINT #4;M$(1,15):NEXT I
AFJ 2830 POSITION 4,22:INPUT #2;M$:PRINT #4;C32$(1,50);C32$(1,9);M$(1,15)
RBJ 2840 A=USR(ADR(INV$),7,4,26):A=USR(ADR(INV$),4,8,15)
OAJ 2850 A=USR(ADR(INV$),21,8,15)
YVJ 2860 FOR I=12 TO 14:POSITION 7,I:A=USR(ADR(INV$),7,I,26):NEXT I
WWJ 2870 PRINT #4:CLOSE #4:POSITION 21,22:PRINT C32$(1,15);:RETURN
BCJ 2880 POSITION 21,22:PRINT "ERROR ";PEEK(195);C32$(1,5);
SUJ 2890 XF=21:YF=22:LF=9:GOSUB 650:RETURN
ICJ 2900 TRAP 2930:CLOSE #4:OPEN #4,8,0,"D:NAME.DAT"
DEJ 2910 PRINT #4;NUM:FOR I=1 TO NUM
DKJ 2920 PRINT #4;NAME$(I*29-28,I*29):NEXT I:CLOSE #4:CLOSE #3:RETURN
AVJ 2930 PRINT "ERROR #";PEEK(195);"."
VKJ 2940 POKE 752,1:PRINT "PRESS START TO CONTINUE";:Y=PEEK(84)
LVJ 2950 A=USR(ADR(INV$),9,Y,5)
TZJ 2960 IF PEEK(53279)<>7 THEN 2960
FUJ 2970 GOTO 2900
MUJ 2980 TRAP 2880:CLOSE #4:OPEN #4,8,0,"P:"
URJ 2990 POSITION 21,22:PRINT "ESC TO STOP";C32$(1,4);:POKE 764,255
NHJ 3000 A=USR(ADR(INV$),21,22,3)
MRJ 3010 CLOSE #3:OPEN #3,4,0,"D:PHONE.DAT"
DXJ 3020 PRINT #4;"NAME/ADDRESS";C32$(1,15);"PHONE 1";C32$(1,9);"PHONE 2";
SCJ 3030 PRINT #4;C32$(1,9);"NOTES"
FUJ 3040 PRINT #4;"------------";C32$(1,15);"-------";C32$(1,9);"-------";
LSJ 3050 PRINT #4;C32$(1,9);"-----"
VPJ 3060 FOR I=1 TO NUM:NM$=NAME$(I*29-28,I*29)
RDJ 3070 IF PEEK(764)<>28 THEN 3100
MLJ 3080 POSITION 21,22:PRINT "INTERRUPTED";C32$(1,4);:XF=21:YF=22:LF=11
XIJ 3090 GOSUB 650:CLOSE #4:RETURN
RFJ 3100 HS=ASC(NM$(LEN(NM$)-2)):LS=ASC(NM$(LEN(NM$)-1))
OCJ 3110 B=ASC(NM$(LEN(NM$))):S=HS*256+LS:NM$=NM$(1,26)
KDJ 3120 POINT #3,S,B:PRINT #4
PRJ 3130 INPUT #3;PHONE1$:INPUT #3;PHONE2$:INPUT #3;ADDR$:INPUT #3;MEMO$
KFJ 3140 PRINT #4;NM$;CHR$(32);
IPJ 3150 PRINT #4;PHONE1$;CHR$(32);PHONE2$;CHR$(32);MEMO$(1,15)
YIJ 3160 FOR J=1 TO 3:PRINT #4;ADDR$(J*26-25,J*26);C32$(1,33);
SVJ 3170 PRINT #4;MEMO$(J*15+1,J*15+15):NEXT J
PTJ 3180 PRINT #4;C32$(1,50);C32$(1,9);MEMO$(61,75):NEXT I
YUZ 3190 CLOSE #4:RETURN
```

Parrot Sound
continued from page 78

sound files that have been organized into tracks are referred to as structured files. A typical track is created by examining a graph of the sampled sound, determining the memory locations of the beginning and end points of the actual sound segment that is desired, and then defining those memory locations as one of the tracks. With practice, you could even cut out a single note of an instrument from a song and define it as a track. The Emulator program also lets advanced users actually modify the sound waves on the screen with the joystick.

Once your tracks are defined, you can play music with your sampled sounds. The first three rows of the keyboard are defined as musical keys, while the bottom row is used to select one of the nine tracks.

A generous number of sample structured sounds are included on the Parrot diskette. These sounds include a variety of drums, a piano, horn, guitar, starting cars and barking dogs. Playing these sounds on the keyboard is enormous fun, and playing your own sounds is even more exciting.

BASIC Subroutine

The Parrot diskette contains a BASIC subroutine that allows you to put your sampled sounds into your own BASIC programs. On the diskette is also a guess-the-number game (higher, lower, a little higher, etc.) which demonstrates how this subroutine can be used in your own programs.

Documentation

The 39-page instruction booklet is complete and well written. Special sections discuss creating custom sounds, using sound files in your BASIC programs, and storing sounds on a 130XE. The appendices include a trouble-shooting guide, sample "sheet music" songs for the keyboard, a description of waves, and a glossary of terms.

Conclusions

While my first impressions of the Parrot were negative, the software included with the package quickly changed my mind. And despite the homemade looks of the Parrot hardware, the sampled sounds are of comparable quality to the more attractive and expensive Voice Master. I would like to have seen a music-writing program or a voice recognition program, like those included with voice Master, but perhaps Alpha Systems will release additional software for the Parrot in the future.

If you're itching for a sound digitizer, and don't mind that someone might try to use it as a game paddle, the parrot should suit your needs. At $39.95, the package is a great value.

Requires:
- 8-Bit Atari Computer
- Disk Drive
- Joystick

Author:
Tony Ramos

Price:
$39.95

Warranty:
90 days, free replacement

Manufacturer:
Alpha Systems
4435 Maplepark Road
Stow, OH 44224

Ratings For Parrot Sound Digitizer Package

*Poor, **Fair, ***Good, ****Excellent

Design: Hardware	*
Design: Software	***
Practicality	***
Documentation	****
Value for price	****
Average	***

Hacking The ST

by Wynn Rostek

Mutual ST Help

I had mentioned in a previous column that everyone was looking for a source for the video connectors used on the ST. Search no longer, we have found a source. Mark Spires from "At Your Service" has the connectors. It took Mike 3 weeks worth of phone calls to locate a source for the connectors. The connectors are $15 each, and he has 5 foot cables with composite video and audio for $20.

I suggest you contact Mike before ordering, he can not take VISA or MASTERCARD. The address is: At Your Service, 2856 Leechburg Rd., Lower Burrell, PA 15068, ATTEN: Mike Spires.

You can also order the connectors and cables by leaving a message or Email on the Atari Elite BBS. The Atari Elite BBS is an ST FOREM board and runs 300, 1200, and 2400 baud. It is up 24 hours a day. The BBS number is (412) 384-5609. If you want to talk to Mike, call him at (412) 335-4477.

ATTENTION! Mike Spires also passes along a tip, the STs with a built-in RF modulator have composite video on pin 2 of the video connector. This is not mentioned in any of the Atari documentation, the service information.

Fred Hawkins suggested that we investigate the fflush function for clearing buffers. The fflush function is used to force a disk write. The ST buffers disk data in memory. Each open disk file has its own buffer. When you write to disk, you are really writing to memory where the disk data is buffered. To ensure that any change you have made to the file is actually on the disk, you can use the fflush function to force a disk write. The fflush function works only if you use the C file functions.

When you close a file, or exit a C program, it will call fflush to ensure the disk is updated correctly.

Since we used the Bconin functions, we have bypassed the C file functions, and the fflush wouldn't work anyway. In most systems, fflush does not work with physical devices, only disk files. (In spite of the attempt to erase all differences between devices and disk files, some still exist.) Fred also has good words for *Common C Functions* by Kim Jon Brand. I have not seen this book, but I have several other books on C from Que, and all of them are excellent.

F. H. Marz is trying to use the graphics capabilities of the ST, but is looking for a language other than C to do it with. He is looking for a good book on Logo. The book Atari supplied, *A Sourcebook for Atari Logo* is too brief for beginners. I have not used Logo, but there is a book *Atari ST Logo* by Martin Sims from Hayden Book Company that covers programming in Logo on the ST. *The Atari ST User's Guide* by John Heilborn from Osborne McGraw-Hill also has a couple of chapters on Logo programming. I have not read either of these books, but I have noticed them on the shelves of our local bookstore. (I can only afford to buy so many books a week, and Logo is one language I have not really played around with.)

Logo is not really the language to use for graphics programming on the ST, many of the special features of GEM (most of them in fact) are not available in Logo. If you find C too hard (it is not a beginner friendly language) but still want to try to use the special features of GEM (like drop-down menus, windows and alerts) you may seriously consider Personal Pascal from OSS.

ST BASIC also has interfaces to many of the GEM routines, look in your copy of *ST BASIC Sourcebook* under GEMSYS. You will need additional information on the AES interface in order to use this function. The only good sources I know of now are the ST developers kit and *Atari ST GEM Programmer's Reference* from Abacus.

I will be briefly reviewing *Atari ST GEM Programmer's Reference* here to give you some idea as to whether you want to buy it or not.

Chapter 1 is a brief introduction to GEM. Since Chapter 1 is only 9 pages long, the introduction is very brief indeed. Chapter 2 is a very short introduction to C and 68000 assembly language programming. I think this section could have been easily left out, it is too brief to serve as a guide for anyone using C or 68000 assembly language for the first time. There are many good books available on C programming and 68000 assembly language.

Chapter 3 covers the VDI portion of GEM. Pages 61 through 229 contain definitions of the VDI functions and tells you the input and output parameters used. This is a good explanation of what functions are available, but it is not a tutorial on the use of the VDI. They have presented 6 C programs and 2 assembly programs at the end of Chapter 3 to illustrate the use of some of the VDI calls. This should be enough to get you started, and experimenting with the VDI calls can be an awful lot of fun.

The VDI is the low level graphics interface of GEM. (The line-a interface is the lowest level graphics interface, and I'll cover a few of the line-a routines later in this column.) The VDI allows you to prepare the ST for graphics operations, load and unload different fonts (text styles) and draw lines, polygons, bars, arcs, circles, ellipses and select fill patterns. It also provides an interface to the mouse and keyboard.

Chapter 4 covers the AES. The AES is the workhorse of the Desktop. The AES allows you to use menu bars, dialog boxes, icons, and windows. The first part of Chapter 4 is an introduction to the way the AES handles the major functions. This section gives you some insight into how to use the AES calls to create a graphics program.

The AES information is presented in a more tutorial format with a lot of explanation in the first part of the chapter. The middle portion of Chapter 4 is a list of the AES functions and the parameters used by them. The end of Chapter 4 contains a C program and 3 assembly language programs showing the AES in action.

I was not overly impressed with Chapters 1 and 2, and I wonder why they even bothered to include them. Chapter 3 is a good run-down on what VDI functions are available but could have used a little more explanation of some of the functions. The coverage of the AES functions in Chapter 4 is very good. The explanations given go a long way towards making the AES easier to use. We have the AES documentation from the developers tool kit and from a GEM seminar given by DRI, and they are not as useful to the average programmer as Chapter 4 of *Atari ST GEM Programmer's Reference.*

If you happen to have some graphics background, GEM is based on the GSX package developed by DRI, which was based on the GKS standard. If you know GKS, you should be able to pick up GEM in a day or two.

Atari has just notified us that a new version of the Alcyon C compiler is available. There is a $20 upgrade fee for the new version. The new version has cleaned up some minor bugs and added double precision floating point numbers. They have also provided a working version of the archive utility AR68, a tool I am looking forward to having.

Line-a Interface

I have mentioned the line-a interface several times. This month I'll give you a few quick routines to show some of the line-a routines in action. One thing you will notice from the VDI and AES documentation is that the screen positions on the ST have the origin in the upper left corner. 0,0 is the top left-most point on the screen. This means that the Y axis is upside down from what you would expect.

One of the nice things we can do here is flip the Y axis back around the way you would expect it to be.

Unlike most columns, this column will have some assembly language routines. If you are serious about hacking the ST, you will need to learn assembly language sooner or later. The routines presented here are set up so they can be called from the Alcyon C compiler.

When you call a function from C, the assembly language generated does something funny with the names of the function. The Alcyon compiler adds an underscore as the first character of a name. If you have the following code;

```
result = conver (x);
```

The assembly language generated by the compiler would look something like:

```
move.w      12(sp),-(sp)
jsr          _convert
move.w       d0,14(sp)
```

The important thing to keep in mind when writing assembly language routines that you may want to call from C is to always use an underscore character as the first character of the name.

Before I get into the program proper, I'd like to give you a little background information on graphics so you can follow the code a little better. Suppose someone asks you to draw a diagonal line across a sheet of paper. With a straight edge and a pencil, the task is pretty easy. This is because you are dealing with a continuous process. On the screen of your ST, it is a little trickier to draw a line because the display is discrete.

There are 640 dots horizontally and 200 dots vertically on the ST in medium resolution. If you want to draw a line from the point 0,0 to the point 4,3, you would have to decide which pixels to turn on. Just connecting the points with a straight line is an easy solution, but the ST has only a limited number of pixels to work with, so it has to decide somehow which pixels should be on.

Converting a continous line to a series of pixels is called rasterization, and there are several ways to do it. One of the simplest ways to go about deciding which pixels to turn on is to use the Basic Incremental algorithm. Conceptually, this approach is very simple. If you know the two end points x1,y1 and x2,y2, you can find the slope of the line connecting the two points. The slope is delta y / delta x or (y2 - y1) / (x2 - x1). If you compute the slope M, then you can find out which pixel to turn on by turning on the first pixel, then incrementing x and adding M to the y value. If you round y off, you have the next pixel to turn on.

The reason this works is because the slope is really how much y changes for each unit change in x. If the points were 0,0 and 4,3, then the slope would be (3 - 0) / (4 - 0) or 3/4. This means that everytime you add 1 to x, you should add .75

continued on page 184

LISP On The ST

by H. Clark Robbins

You started with BASIC, Pascal, and Fortran so you need a change. C is a challenge, but you need something really new in your life. Different. Exciting. Challenging. Cheap. I know just what you need.

It is solid, standard, available for your machine, and it is free. It's XLISP.

XLISP has been available in the public domain for a long time. There are versions for CP/M, PC, Mac, Atari ST and Amiga. XLISP, as you may have guessed, is a version of LISP, the LISt Processing language. LISP is generally recognized as the Artificial Intelligence language.

It is easier to tell you what LISP is than to tell you what Artificial Intelligence is. Nearly all the AI programs are written in LISP. Expert problem solvers can diagnose internal combustion engine problems or blood diseases. LISP programs can simulate human reasoning, condensing huge volumes of information to make decisions or ascertain trends. The most interesting AI area is that of learning, in which computers use "past experience" to deduce facts. However, it is easy to start fooling around with LISP without having any background in AI. After you see what LISP can do you will get a handle on the concept of Artificial Intelligence.

Until recently there was no standard for LISP, which allowed it to grow and change. Now many LISP programmers are choosing to use a Common LISP, which makes their code more transportable. It is interesting to note that LISP procedures and LISP data use the same format. Therefore, it follows that a LISP procedure can write a LISP procedure and then execute it.

What LISP does better than anything is list manipulation, of course. You can cut lists up, put them back together, move elements from one list to another, treat lists as data or use them to manipulate other lists. You can search them, sort them, and call them recursively.

Recursion is widely used in LISP. This sample shows a simple case of recursion: the factorial of a number.

```
user:       (defun factorial (n)
                                                    ; define the function
                   (cond ((= n 1) 1)                ; test for done
                   (t (* n (factorial (- n 1))))))  ; multiply recursively
XLISP:      FACTORIAL
user:       (factorial 4)
XLISP:·     24
```

In XLISP symbol names can be made up with any sequence of printable characters, excluding ( ) / ' " , ; and blanks. All lower-case alpha-characters are interpreted as upper-case. This allows you to create some very meaningful symbol names. Note that this also allows you to "rename" some of the existing primitives from XLISP. For example a programmer could customize his procedure for multiplying numbers.

First I must warn you that this is going to look a little different from what you are probably accustomed to. The word "bizarre" may immediately come to mind. However, there is some method to LISP's madness: the first element of a list is the procedure, followed by some number of arguments. A programmer could enter:

```
user:       ( * 3 5 2 )
XLISP:      30
```

to perform the multiplication 3 x 5 x 2. If he wanted to wreak a little havoc, he might modify his code to say.

```
user:       ( setq my-multiply *)
user:       ( my-multiply 3 5 2 )
XLISP:      30
```

On the other hand, it may be advantageous to use one of the symbols that are popularly "reserved keywords" for some other purpose. If this programmer knew he would not need a division function for his program but needed a symbol to save the ASCII representation of the slash character, he may choose to save it as that symbol.

```
user:       ( setq / 47 )
user:       ( eval / )
XLISP:      47

        So if there is a need to accommodate a mathematician that
doesn't like to type much, we can create FACTORIAL  as simply the
symbol " ! ".

user:        (defun ! (n)                                ; define the function
                   (cond ((= n 1) 1)                     ; test for done
                   (t (* n ( ! (- n 1))))))              ; multiply recursively
XLISP:      !
user:       (! 4)
XLISP:      24
```

XLISP was written by David Betz in C. XLISP 1.1 appeared in the public domain for CP/M 80 a few years ago, but lacked a lot of the "standard" features. That was because the compiled code filled a good portion of memory, leaving little room for XLISP applications. Even today XLISP 1.1 is the highest rev available for CP/M 80. XLISP 1.5 is available for the PC, Amiga, and Atari ST. This version is standard, capable, and easy to use.

Each version of XLISP includes a document that is unusually comprehensive, considering the usual public domain documentation standards. In his document, Betz covers the features he incorporated into XLISP, and a discussion of the data types, symbols, and functions of XLISP. Of course, like all language software documents, it is not intended to teach you LISP, but rather to instruct you in the use of XLISP. Betz recommends the text LISP, 2nd Edition, by Winston and Horn. You might want to look it over before you start LISPing.

XLISP is an interpreted language, which makes it a fine learning tool. As each line of code is entered, terminated by a carriage return, the XLISP prompt tells you the level of nesting still unfulfilled, i.e. the number of unclosed parentheses. In complex procedures that is usually an indication the user has forgotten one of the many parentheses terminating a procedure: an error akin to forgetting a semicolon in Pascal.

XLISP supports many esoteric list manipulation symbols not supported by other LISPs, e.g. "nthcdr" is the nth element of a list. You can easily create many more of these symbols as needed. XLISP also supports the outdated PROG feature, which may be helpful if you are trying to resurrect a program ported from another machine. XLISP's *BREAK-ENABLE* feature provides an "error-level" display with every prompt to the user. Incrementing with every fauXLISP pas, it is an everpresent reminder of your fallibility. This feature may be useful to XLISP experts, but it can be confusing to the neophyte. This is a default and can be changed, but it is easiest to just try to ignore it. It will keep you humble.

XLISP is not without its flaws. You can save and load functions you define, but there is no way to save the entire working set. This is a major drawback if you are just fooling around and you create a work of genius: you have no way of recreating the sequence of steps you took to get there. Of course, this will never happen to any of us because we all design before we code, don't we?

Have fun with XLISP. If you would like to use it commercially, you will first need to talk over the commercial implications with David Betz. He will even provide technical assistance to users in trouble. How many contributors to the public domain can say that? Even though this was not distributed as shareware, I'm sure he wouldn't mind being thanked in a concrete way for his help. Betz is currently working on XLISP 1.7 for the PC, Amiga, Mac, and ST. That should be out in a few months with some new features and new documentation. XLISP users are looking forward to that.

XLISP is not all things to all people. After having played with XLISP for a while, if you are really hooked and want to spend a lot of time with a LISP, you should check out Golden Common Lisp for the PC, a Common LISP developed by Gold Hill Computers (163 Harvard St, Cambridge, Massachusetts 02139 (617) 492-2071). It is a complete LISP developing environment. It has an GMACS editor, a GC LISP interpreter, on-line help, examples, and the San Marco Lisp Explorer, a full blown on-line tutorial. The user interface is very comfortable with all the bells and whistles you can imagine: in the interpreter, the level of nesting is annotated by the blinking parenthesis that opens the current level of nesting—what a handy feature! The package includes comprehensive documentation and two texts, one of which is the ubiquitous LISP, by Winston and Horn. The price is around $500 so I obviously can't recommend a hobbyist run right out and buy it if he has never used LISP before and doesn't know if he will like it. (Universities can get six or more copies at $100 each.) I was surprised to learn the package is copy protected because I don't know anyone who could recommend you buy development tools that are copy protected. But if you're a serious LISP lover, there is no better environment for development.

Of course, if you would like a look at an Artificial Intelligence example from a creative standpoint, there's HippoBackgammon. And you don't have to learn a new language.

Hippo Soft now has a backgammon game available for the Atari ST. Computer adaptations of parlor games have been around since the early days of computers and really haven't changed very much. Each game developer tries a twist to keep his game from looking pretty much like one that ran on a TRS 80 ten years ago. The twist in HippoBackgammon is Artificial Intelligence. Hippo Soft wants to teach the user the meaning of AI by allowing him to modify the thinking of his computer-opponent, called a Robot.

Backgammon is a simple game: the rules can be learned in an hour and the techniques can be learned in just a few sessions. The ability to alter the characteristics of your opponents is a great tool in learning Backgammon style. You can change the significance to each of your Robot's moves to make it play a different strategy. Their preprogrammed "expert" Robot is pretty darn good. The Expert Robot plays a very conservative game. It doesn't like a bloodbath. I do. It usually wins.

A few general comments on the program: HippoBackgammon has a very nice display in low res. The colors selected are pleasing to the eye, and provide a professional look. After your eyes get a little tired the red begins to look too much like the black. The other color selection, blues, lavenders, and purples is much easier to see but is aesthetically unpleasing.

The Backgammon setup seems awfully slow, but is only 15 seconds. The game defaults to a human vs expert robot game, with human getting first roll of the dice. This can be changed from within a pull-down menu, allowing the user to elect to challenge one of his customized robots or one of three preprogrammed robots: Expert, Medium, or Novice. If he so chooses, he can have two robots play each other and just sit back to watch the fun.

In the human vs Robot game the human makes his move then passes the dice to his opponent by clicking once on the dice. Until you pass the dice, you can use UNDO to change your move. The program will make sure that any move you make is legal; otherwise it will return the piece to its origin and allow you to try it again. There is never an indication that all your legal moves have been made. In fact, the software does not force you to take

continued on page 180

LISP
continued from page 80

all your legal moves, allowing you to never leave yourself vulnerable. That is very kind, but it is not the way the game is played. Moving the pieces with a mouse is a bother, considering that they must be moved in discrete steps that would lend themselves so well to keypresses.

Passing the dice requires a long click or the game will not recognize the command. The robot's dice are automatically rolled, he moves, passes the dice to you, and the dice are automatically rolled for you. It doesn't give you much time to examine the Robot's roll or his play.

All in all, HippoBackgammon is a fun game. It sells for $39.95 and is available from your dealer or Hippopotamus Software (985 University Ave, #12, Los Gatos, CA 95030, (408) 395-3190). The program is copy protected, but allows you to back up your customized robots on another diskette. At least this allows you to write-protect your only copy of HippoBackgammon. The ability to "program" your Robot teaches you about components of the game you may have never thought of before. It may also give you a feeling for the complexity of writing such a game and the decision-making processes involved.

Since there is big money only in new and innovative programming, perhaps beginning developers may want to look more closely at LISP and Artificial Intelligence programming. It may just be the better mousetrap they are searching for. ●

Personal Pascal For The Atari ST

by W. Krieger

Since it's creation in 1968 by Niklaus Wirth, Pascal has steadily risen in popularity to become one of the most widely used computer languages. There are many reasons for this popularity. Pascal was designed originally as a teaching language, and as such is much easier to master than either C or assembly. The strong structure of Pascal almost forces you to develop and use good programming techniques. Another big plus for the language is the availability of excellent low cost compilers for a wide variety of computers.

As an Atari ST owner I was very happy to see this carry over to the ST line. Optimized Systems Software, Inc. (1221 B Kentwood Ave., San Jose, CA 95129) has released Personal Pascal for the ST for only $74.95. OSS has been a long time supporter of the 8 bit systems by Atari, and have released several other languages for the 8 bit line. Including Action, Mac-65 and BASIC XL, all good products.

Personal Pascal is the first package I've seen from OSS for the ST and happily they have once again come out with a fine product. This is a very good Pascal package that includes everything you need to develop programs for your ST,: Editor, Compiler, Linker, and GEM support, all in one low cost easy to use system.

The first thing you notice when you open the Personal Pascal package is the manual, two hundred, over, pages of documentation. It is well written and divided into logical sections explaining the major parts of the Personal Pascal system. My only major complaint with the documentation is the lack of an index. I find myself constantly leafing through the book trying to find an answer to this or that question. I don't mean to imply that the text isn't well organized, it is, just that any technical publication of this size needs an index.

A big plus for the manual however is the honesty and cleverness of the writers, they tell it like they see it. For example in the introduction to

continued on page 181

Inside Commodore
continued from page 178

the C-128 ad was really meant to be tongue-in-cheek, its comparison between the C-128 and the 520 ST, is much fairer. And, feature for feature (just like Atari does it) the C-128 comes out on top!

It's provocative things like that which make *INFO* worth reading, even if it is a little expensive ($3.60 a bi-monthly issue). If you haven't seen this magazine, you're missing a lot of gut level reviews of software and hardware (not the sugar coated junk in some other Commodore-oriented magazines). Each issue, while often whirrling with the latest scuttlebutt, is also entertaining (to say the least) and full of...well...general Commodore info. (Which, I guess, is why it's named that.) Subscriptions are $18.00 a year, and single copies of back issues are $5.00. Get a recent copy and see if you like it: *INFO*, P.O. Box 2300, Iowa City, IA 42244.

Commonly Used Bulletin Board System (BBS) Abbreviations

Abrev.	Type of BBS it Describes
ABBS	Apple Bulletin Board System (Apple based)
AMIS	Atari Message Information System (Atari based)
CARN	CARNIVAL Bulletin Board (Atari based)
CBBS	Computerized (Christensen) Bulletin Board System (CP/M based)
CCBS	Commodore Computer BB (C-64 based)
CCMS	Computer Conference Message System (S100 based)
COCO	Color Computer BB (TRS-80 based)
CONF	Conference Tree System (Apple based)
DIVD	Diversi-Dial Multi-User System (Apple based)
DYM.	Dial-Your-Match (Apple or C-64 based)
ERAC	ERAC BBS (TRS-80 based)
FIDO	FidoNet International BBS Network (MS-DOS based)
FORE	FOREM Message System (Atari based)
FRON	Frontier BB (TRS80 Model 100 based)
GBBS	Apple-Based BBS (Apple)
IBBS	PC BBS (IBM-PC & Compatibles)
JNET	PCjr BBS (IBM-PCjr based)
MAC.	Macintosh BB (Macintosh based)
MCMS	Micro Computer Message System (TRS-80 based)
MUSR	Muser Multi-User System (Apple Based)
NBBS	North Star BB (NorthStar based)
NET.	Net-Works Communications System (Apple based)
NEWS	News and Message Service (TRS-80 Mod-16 based)
OABB	Other Apple BB (Apple based)
OTBB	Other TRS-80 BB (TRS-80 based)
PMS.	People's Message System (Apple based)
RBBS	Remote PC BB (IBM-PC & Compatibles)
RCPM	Remote CP/M BB
TBBS	The Bread Board System (TRS-80 & MS-DOS based)
TIBB	Texas Instruments BB (TI99/4a based)
UBBS	Universal BBS (Apple based)
UNIX	Unix BBS (PC based)

Table #1 - BBS Abbreviations ●

TERMINALS

Quality Used Terminals
Tested and with
30 days warranty

TELEVIDEO	
910/920	$199
925	299
925E	399
950	399
ADDS	
Viewpoint	199
AED	
AED 512	1999
Perkin-Elmer	
1100	$199
1200	249
Hazeltine	
1500	149
Esprit	149
Vector	
MT	149

MAC ACCESS

External Hard Disk System
for Macintosh or Mac-Plus

★ Supports HFS
★ Supports a wide variety of disk drive types from 5 MB to 43 MB
★ Runs on either printer or modem port
★ Comes with operating software and instructions
★ 90 days parts and labor warranty
★ Hard disk drive can be user installed in less than 5 minutes

System price w/o Hard Disk Drive $349.
w/ 10 MB Hard Disk $499.
Adapter cable (for Mac-Plus only) — add $20.

MOTHERBOARD FOR IBM

$59 Motherboard by Faraday mounts in PC or compatible case
★ 64K Memory installed w/256k expansion on-board (above 256k obtained with card)
★ I/O Ports on-board (1 parallel, 2 serial)
★ 4 additional expansion slots
★ complete operation and installation manual
★ 90 day parts and labor warranty

Set of 3 DB-25 connectors & cables for above — add $10.

All items shipped U.P.S. Freight Collect unless instructed otherwise. CA residents add 7% sales tax. To order, send check or money order or:

VISA Credit Card Orders Call TOLL FREE MasterCard
(800) 821-5226 ext. 440

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Personal Pascal
continued from page 180

the GEM library the manual states. "If you have been unlucky enough to see the Digital Research and Atari Corporation documentation, you will realize that even 2,000 pages are not enough to describe everything which can be done with GEM." For this refreshing approach to documentation I can almost forgive them for not having an index.

The Manual is divided into six sections, System Overview, Editor Reference, Compiler Reference, Linker Reference, GEM/Pascal Library, and the Language Reference. There are also appendices on the error messages and ASCII codes. Each section is organized to present the information in the same order you will be likely to need it.

Using the Personal Pascal system is simple. Everything is supplied on one single sided nonprotected disk. The system is accessed from a shell program (PASCAL.PRG) from which you use the mouse to set compiler and linker defaults or to invoke any of the three main functional parts: the editor, compiler or linker.

The editor supplied with the package isn't bad. I wouldn't want to use it as my primary editor but it has enough features to get the job done. In fact the best description of the editor comes from the Personal Pascal manual. "It (the editor) is not designed as a word processor or other general text editor, and it lacks many of the features one would expect to see in such a product. As a program editor, though it is at least adequate."

The best feature of the editor is that it is integrated into the Personal Pascal system. When the compiler finds a bug in your source code an alert box will appear on the screen asking if you want to ignore the error, edit the source or quit. If you choose to edit option, the editor is brought up, with your source file already loaded and the cursor on the line where the error occurred. This makes those missing semicolons a lot easier to live with. (For those of you who haven't used Pascal, every statement in Pascal must be separated by a semicolon. Leaving these out is one of the most common errors in Pascal.) Then when you are done fixing the error just hit F9 and your modified code is saved to disk and the compiler is invoked. This is the similar to the system used in Borland's Turbo Pascal and is in my not so humble opinion the way all compiler editor packages should be set up.

The compiler is however more than just adequate. While not the fastest in the world it does everything it's suppose to and does them well. The speed problem is due to disk IO, this is a common problem with running a compiler on a floppy based system. Luckily Personal Pascal isn't copy protected so you can easily run it from either a hard disk or a RAM disk. I run mine out of a RAM disk on my 1 meg. 520 ST and find this to be very quick.

Setting the different compiler options is done from the shell program. Just pull down the options menu and click on compiler. This opens a window with the compiler options using the mouse to select or deselect the ones you want.

The possible settings include compiling to a GEM or a TOS program. You can also turn on or off Pause after errors, full debug mode, range checking, stack checking, clear variables, and if you want it to automatically invoke the linker or not. You can also use compiler directives in your source code to set some of these and several other options. The most important of which is the ability to compile to a module for later linking.

Modular compilation will allow you to use Personal Pascal in concert with other programming languages, like C or assembly. The modules created are link68 compatible (the linker supplied with the developers system from Atari). The main use for this will more than likely be the linking in of assembly language routines to handle either time critical procedures or low level system calls.

The ability to compile to a TOS application allows Personal Pascal programs to be nearly indentical to Pascal on an IBM PC or other standard type system. I highly recommend this for novice programmers trying to learn Pascal. Any standard Pascal book can be used to get you started with Personal Pascal, then after you get the program running the way you want it is easy enough to come back and add the GEM features you want. While it's true that Pascal is relatively easy to learn, trying to master a new language and GEM at the same time is not something I would want to do.

The linker supplied with the system is fine. It seems to be fairly standard. It is easily accessed from the shell program. But in most cases it will be chained to the compiler so you can almost forget that it's there, unless you get to the point where you are linking together modules from two or more compilers. I see no reason

continued on page 186

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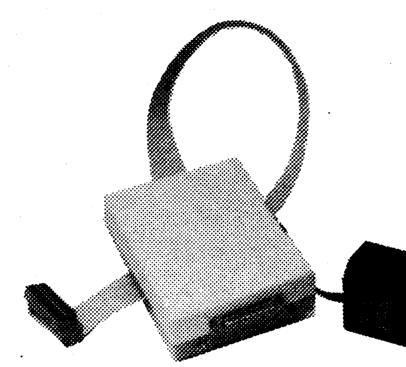

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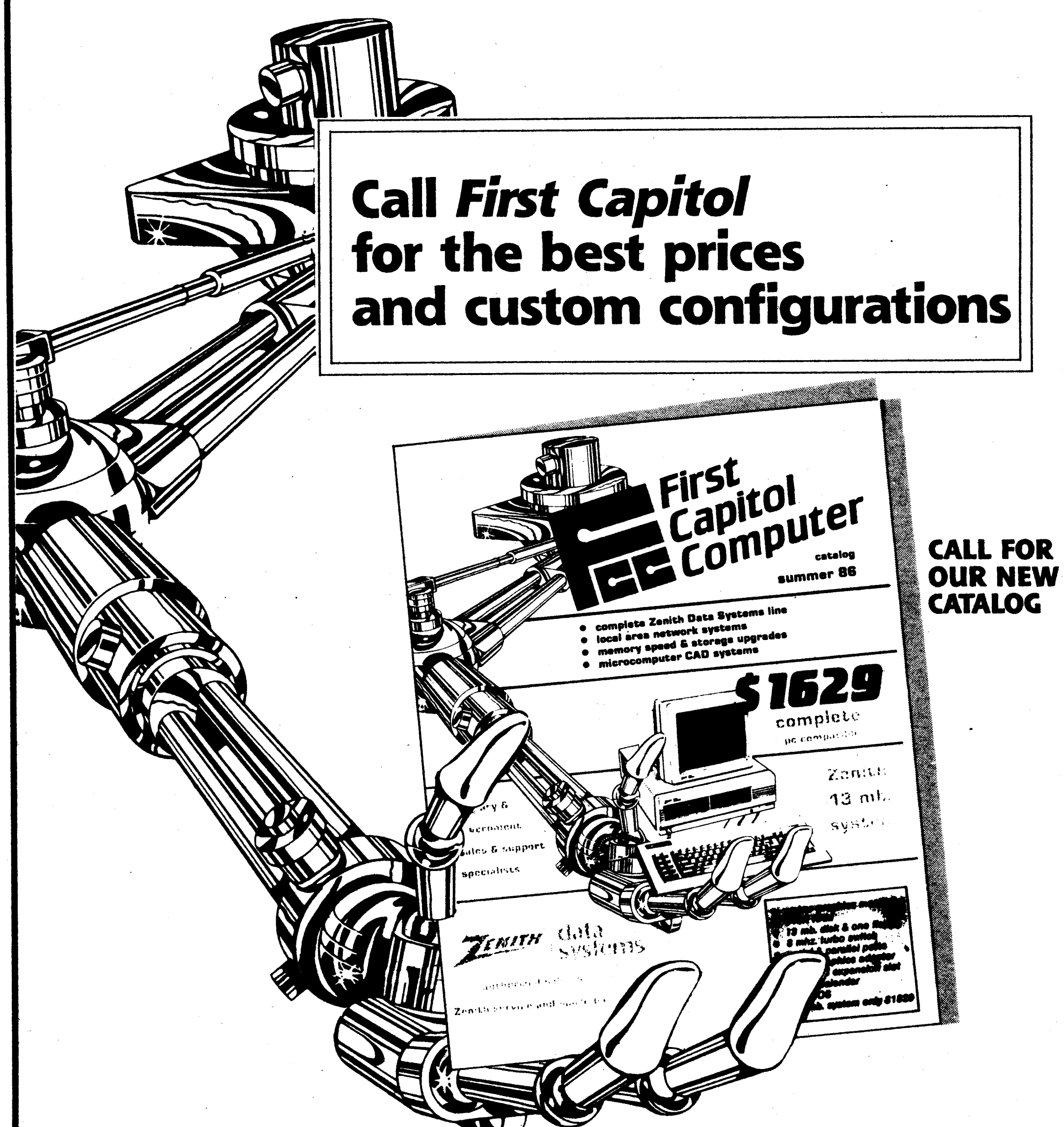
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Hacking The ST

continued from page 79

to y. With our points, you proceed as follows: turn on 0,0; add 1 to x and .75 to y. Round off y (.75) to 1. Set point 1,1 to on. We continue by adding 1 to x and .75 to y. x is now 2 and y is 1.5. When we round off 1.5, we turn on the point 2,2. We bump x to 3 and add .75 to y; y is now 2.25 and rounding it off gives 2 so we turn on the point 3,2. Adding 1 to x and .75 to y gives us 4 and 3, so we round 3 off to 3 and turn on the point 4,3.

The disadvantage of this approach is that it requires the use of floating point math to compute M and for the adjustment to y. Floating point is time consuming, so if you can get away from it, your graphics would be quicker.

There is another approach to rasterization, known as Bresenham's Line algorithm. Bresenham's algorithm uses only integer math, which is much faster.

Instead of keeping track of the exact value of y for each step, Bresenham's algorithm tries to keep track of the relative size of y, without knowing the exact y value. The way it does this is to use two values for the adjustment of y, these are usually called incl and inc2 for increment 1 and increment 2.

incl is simply 2 * (y2 - yl) or 2 * delta y. inc2 is 2 * (delta y - delta x). This means that incl is always positive and inc2 is negative. We keep track of the relative value of y with a variable called d. When you bump the value of x, we look at the relative value of d, if it is negative, we add incl to it and we do not bump the y value. If d is positive, we add inc2 and we bump the y value. We start out with d equal to (2 * delta y) - delta x.

With our example, delta y is 3, delta x is four. This gives us an inital d of (6 - 4) or 2. incl is 6 and inc2 is -2. We turn the point 0,0 on, and then we add 1 to x. Since d is positive, we add 1 to y and add inc2 to d, d is now 0. We turn the point 1,1 on. Adding 1 to x, we get 2. Since d is 0 we add 1 to y and inc2 to d, making d -2. We set the point 2,2 on and we are ready for the next pass. We add 1 to x, and since d is negative, we add incl to d and do not bump the value of y. We can turn on point 3,2 to finish the pass. To finish the line, we add 1 to x, since d is positive, we add inc2 to d and bump y to 3. Setting the point 4,3 on finishes the line.

You will notice that Bresenham's algorithm sets the exact same points on as the Basic Incremental algorithm, but uses only integer arithmetic. Both of these algorithms draw an approximation to the line, and on longer lines you will notice that they generate a pattern. Except near the end points, there will be a certain number of points with the same y value. You might notice that a certain line will have 3 points with the same y value in a row, then another 3 points in a row.

The ST can draw a horizontal line very quick, so the line-a interface really draws a series of short horizontal lines to place the line on the screen. It has to figure out how many points in a row to draw for each line segment. Once it does this, it can repeatedly call the routine that draws horizontal lines, once for each segment of line.

The routines are written to run in medium resolution, but it would not be too hard to

continued on page 185

```
*
* 05/20/86  Some line-a routines
*

*
* here we have a list of the routines that are exported
*

.globl          _nocur
.globl          _setpt
.globl      _line

*
* here we have a list of defines useful for line-a work
*
intin           equ                     8
ptsin           equ                     12
x1          equ         38
y1          equ         40
x2          equ         42
y2          equ         44
fg_bp_1     equ         24
fg_bp_2     equ         26
ln_mask     equ         34
wrt_mode    equ         36
lstlin      equ         32


*
* here we have a list of functions for the line-a interface
*
init            equ                     $a000
setpix          equ                     $a001
getpix          equ                     $a002
line        equ         $a003

*
* here we have a routine to get rid of the cursor
*
_nocur:         move.w          #50,-(sp)                               * push n
ew flash rate
                        move.w          #0,-(sp)
* turn cursor off
                        move.w          #21,-(sp)
* xbios call to config cursor
                        trap            #14
* perform xbios function
                        addq.l          #6,sp
* clean up the stack
                        rts
*
* a routine to turn a pixel on
* to call from C: setpt(x,y,color);
*
* we have a minor correction of the y value,
* it seems like DRI thinks 0 goes at the top
* of the screen, and the rest of the world
* wants to out 0 at the bottom of the screen
*
_setpt:         .dc.w           init
                        move.l          intin(a0),a3                    * save t
he intin array address
                        move.l          ptsin(a0),a4                    * save t
he ptsin array address
            move.w      4(sp),(a4)              * set x value
                        move.w          8(sp),(a3)
* set color
            move.w              6(sp),d0                * fetch the y value
            move.w      #199,d1                 * y offset
            sub.w       d0,d1                   * correct y value
            move.w      d1,2(a4)                            * set y value
                        .dc.w           setpix
* turn pixel on
                        rts
*
* here is the routine that uses the line-a interface
* to draw a line.  we have to correct both y values
* (see setpt) and we have to translate the color
* value to a pair of foreground bits
*
* 'C' calling convention is line(x1,y1,x2,y2,color);
*
_line:          .dc.w           init                                    * get po
inters
                        move.w          #-1,ln_mask(a0)                 * set li
ne pattern (solid)
                        move.w          #-1,lstlin(a0)                  * enable
 draw
                        move.w          #0,wrt_mode(a0)                 * replac
e pixels
                        move.w          4(sp),x1(a0)                    * set x1
                        move.w          8(sp),x2(a0)                    * set x2
            move.w              6(sp),d0                * fetch the y1 value
            move.w      #199,d1                 * y offset
            sub.w       d0,d1                   * correct y1 value
            move.w      d1,y1(a0)                           * set y1
            move.w              10(sp),d0               * fetch the y2 value
            move.w      #199,d1                 * y offset
            sub.w       d0,d1                   * correct y2 value
            move.w      d1,y2(a0)                           * set y2
            move.w              12(sp),d0                               * get co
lor
                        move.w          d0,d1
* prep for mask
                        andi.w          #1,d1
* mask for bit 0
                        move.w          d1,fg_bp_1(a0)                  * set pl
ane 1
                        ror                     #1,d0
* shift bit 1 into place
                        andi.w          #1,d0
* mask for bit
                        move.w          d0,fg_bp_2(a0)                  * set pl
ane 2
                        .dc.w           line
* draw a line
                        rts
```

Listing 1.

Some assembly routines for the line-a interface.

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Hacking The ST

continued from page 184

modify it to run in low or high resolution. You will notice that listing 1 is a series of assembly language routines that interfaces to the line-a routines.

After running some timing tests, it turns out that the Bresenham algorithm is more than twice as fast as the Basic Incremental algorithm, but the line-a drawing routine is more than 5 times as fast as the Bresenham! When I timed the line-a routine, it took only 2.32 milliseconds to draw a small outline house! As you can tell, the ST graphics are fast even though they are done by the 68000 instead of special graphics hardware.

The time has come for a discussion of the xbios and line-a functions used. The assembly routine __nocur uses the xbios 21 function to turn the cursor off. The cursconf function takes 2 parameters, the function and the flash rate. There are 6 functions that can be performed by the cursconf routine. They are:

0	Disable cursor
1	Enable cursor
2	Flashing cursor
3	Steady cursor
4	Set flash rate
5	Get flash rate

Disable the cursor really hides the cursor, it will no longer appear on the screen. Enable is used to make the cursor visible again once it has been hidden. Flash cursor is used to make the cursor a blinking cursor, while Steady cursor gives you a solid, non-blinking cursor. The Get flash rate function returns the old flash rate while the Set flash rate allows you to change the flash rate.

A word of caution about the flash rate, it is based on the vertical scan rate of your monitor. The color monitors use a different scan rate than the monochrome monitors, so the same flash value gives slightly different flash rates. This should cause no real problems because the 2 flash rates should be within 20 percent of each other.

The on time of the cursor and the off time can be found by: on time = off time = rate/vsrate, where rate is the second parameter in the cursconf call and vsrate is the vertical scanning rate of your monitor. In the United States, color monitors for the ST have a vertical scanning rate of 60 Hz, while the monochrome monitors have a vertical scanning rate of 70 Hz.

With a color monitor, if you perform a cursconf(4,30) call, then the cursor will appear on for ½ second and off for ½ second. The rate parameter is only used for the Set blink rate function of the cursconf call. Unlike many other ST calls, DO NOT USE -1 FOR THE RATE PARAMETER IF YOU ARE NOT CHANGING IT, USE 0 INSTEAD. If you use -1 as the rate in a cursconf call, it can cause the infamous "bombs" to appear on your screen.

Listing 2 contains a short program that shows the cursconf being put through its paces.

The next item to cover is the simplest line-a function, the init function. The line-a interface is named after a series of illegal op codes for the 68000. All of the line-a op codes start with a hex a. These op codes cause an illegal instruction exception when the 68000 encounters them.

The exception vectors the 68000 to a small graphics handler. The init function is used to get some addresses we need when working with these graphics functions. The line-a op codes have to be generated with define constant statements because they are not really instructions for the 68000.

The first function we can use to do some work is the put pixel function. To start off our setpoint routine, we perform an initialization call with the $a000 op code. This gives us a pointer to a block of addresses, which we need for the points in array and the integers in array. We move the address of the intin array into register a3

continued on page 186

```
#include <osbind.h>
#include <stdio.h>

main()
/* simple demo of cursor configuration call */

{
printf("Setting cursor to solid.\n");
Cursconf(3,0);
delay(4000);
printf("Turning off cursor.\n");
Cursconf(0,0);
delay(4000);
printf("Turning cursor on.\n");
Cursconf(1,0);
delay(4000);
printf("Setting blink rate for quick flash.\n");
Cursconf(4,7);
delay(4000);
printf("Fast flash.\n");
Cursconf(2,0);
delay(4000);
printf("Setting blink rate for slow flash.\n");
Cursconf(4,90);
delay(4000);
printf("Returning blink rate to normal.\n");
Cursconf(4,30);
delay(4000);
}
```

Listing 2.

Use of the Cursconf functions.

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Table III

continued from page 182

A Primer on Word Processors—With Three Examples
McDonald, C.J.
M.D. Computing Vol.1, No.2, 1984, P. 26-35. 8 Pages.

A physician requires a word processor to improve staff efficiency, the quality of printed documents and letters, and his/her communications skills. PeachText 5000 by Peachtree Software Ltd., Image 3.0 by Micro Art, and Final Word by Mark of the Unicorn are three high-quality programs that make it easy to learn word processing on a personal computer. Two drawings illustrate the cursor control and the keyboard layout. Six screen displays illustrate some of the various commands and features of the three programs. Two displays show PeachText's special print commands for various print formats and its unique thesaurus commands. A display shows Final Word's special section commands for breaking a report into proper title subsections. A display shows Image's outstanding graphics capabilities.

A Sampling of Hardware and Software.
Roberts, K.
Medicine & Computer Vol.1, No.2, Jan. 1984, P. 50-55. 5 Pages.

There are 600 to 1000 medical practice management systems. Not all available systems were included in this buyer's guide. Each system listed had to have a good physician following or a good reputation or the confidence of the *Medicine & Computer* magazine staff.

A Suitable Case for Treatment.
Parkinson, J.
Sifo Group
Middle East Computing No.18, Dec.-Jan. 1984/1985, P. 21-23,25. 3 Pages.

Computers have made inroads into medicine in the Middle East. Computerization began in the 1970s, but was not suited for available technology conditions. Bilingual systems have been a major problem. Computers are generally used for administration, patient administration and diagnosis and treatment. They are also used for planning. Microcomputers and software packages have in-

continued on page 192

Personal Pascal

continued from page 181

why there would be any trouble doing this but I haven't tried it yet.

The GEM library is what you really buy the Personal Pascal package for. I love the way the manual puts this. "One of the most powerful features of the Atari 520 ST is the GEM desktop environment. From a programmer's standpoint, using GEM in a program can be almost impossible. Personal Pascal includes a GEM/Pascal library that provides an easy interface to GEM." I find myself in total agreement with this. I have tried in the past to work with the GEM stuff with the Developer package from Atari and almost gave up due to the frustration. While the GEM/Pascal library doesn't make window and event management as easy as falling off a log, it does make it manageable.

The GEM/Pascal library compresses most of the functions into roughly one hundred Pascal procedures and functions. Yes this is a lot of procedures and functions but there is a lot to GEM. All of the functions and procedures are well explained with a usage example for each. OSS points out that not all the features of GEM have been incorporated into the GEM/Pascal library. They do however include all that most people would ever use. And if you must access a GEM feature not supported in the library you can still access it via a direct call to GEM through the use of "C-type procedures and functions," which is a way Personal Pascal provides for the programmer to reference subprograms written and compiled with a C or assembly compatible with the Digital Research's link68.

All and all Personal Pascal is a good package. But what really makes me recommend it highly is the support that OSS provides their customers. I am convinced that the people at OSS really care about the end user of their products. For example, due to the nature of compilers it is impossible to create a running program that doesn't include some copyrighted code from the compilers libraries.

Many companies make you pay additional fees or royalties if you want to distribute or sell programs compiled with their product. Not OSS. All that they require is that you let them know that you might distribute programs. And that if you do that you include notice of OSS's copyrights in a form visible to the user of your program, displayed no less prominently than any similar notice of your own.

OSS also provides technical support to registered users of Personal Pascal. They have a support group that will answer questions during working hours (Pacific time), they have set up a BBS for 24 hour support, and they can be reached via Compuserve (user 72477,3703). So far I have only used their BBS system and found it well worth the cost of the call to California (I live in Florida).

There are some known bugs in this version 1.01 that are explained on the BBS covers, including information on fixes and work arounds. The routine Bring_to_front (used in window management) was misnamed Bring_to_front, though the manual refers to it by the correct name. Also numbers sometimes appear in the ITEM SELECTOR dialog where they don't belong. And the Delete_Dialog call sometimes causes crashes. OSS has a patch program available for downloading to fix these plus a few more fairly obscure bugs.

There is a problem with the PASLIB file causing undefined symbols if you try to use the Cmd_Arg or Filename functions. If you need to use either of these you must tell Personal Pascal to make two passes through the PASLIB file by putting the name PASLIB into the "Additional Link Files" box in the "Linker Option" dialog.

The routines IO_Check and IO_result will not work unless they are declared to be EXTERNAL. If you need to use them you will need to use the following declarations:

```
Procedure IO_Check (on : Boolean);
  EXTERNAL;
Function IO_Result : Integer ;
  EXTERNAL;
```

The files on the BBS are not all bug reports or fixes. OSS also has many example programs and informational documents for downloading. The document on file IO using GEMDOS calls is a must get. Also the programs showing GEM/pascal library stuff being used are extremely helpful.

The only trouble I have run into that wasn't covered on the BBS has to do with using Personal Pascal on a two drive system. I am used to using Turbo Pascal on my other system where I run the compiler in my A: drive and have all the source and include files in the B: drive. Personal Pascal however is set up assuming that all library and include files will be resident on the disk with the compiler. It will read source code from and write output to the B: drive just fine but if you have any include files or libraries B: drive Personal Pascal will not access them unless you supply the full path name in your include directive I.E. {$I b:Myconst.inc}.

Taken all together the problems with the package are minor, and can easily be worked around until OSS can fix them. The strong points of Personal Pascal far outweigh the weak ones. I can sum up my feeling on it in two words: BUY IT. You will be happy you did. ●

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Hacking The ST

continued from page 185

```
_peekb:        move.l          4(sp),a0                  * get address from stack
                        move.b          (a0).d0                   * get the byte
```

and the address of the ptsin array into register a4.

Once we have the addresses we need, we move the x value and color value into the arrays. The y value is inverted to put 0,0 at the lower left of the screen. When everything has been moved into place, we perform the put pixel call to turn on a pixel on the screen.

The line routine is very similar to the put pixel routine, but we now have two x values and 2 y values. We also have to convert the color value into bit plane values. The routine given handles all the details.

Listing 3 is a simple peek function written in assembly language. This function was left over from the previous column.

If you would like to save yourself the trouble of typing in the programs that appear here, send $6 to: Shopper ST Disk, 3456 Willis Drive, Titusville, FL 32796.

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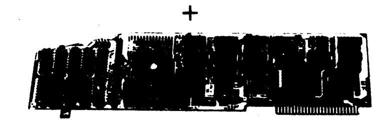

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